A Deposit Return Scheme for Scotland

Outline Business Case

Scottish Government
Riaghaltas na h-Alba
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FOREWORD

This Outline Business Case accompanies the public consultation on the development of a Deposit Return Scheme (DRS) for Scotland. This follows on from the Programme for Government announcement, in September 2017, to develop a DRS designed to increase recycling rates and reduce littering and implement it across Scotland.

The document has been prepared by Zero Waste Scotland, to inform the development of a scheme that meets Scotland's specific needs. It has been written following the HM Treasury "five-cases" model of business case development and is published to set out the evidence behind the information included in the consultation document in a clear and transparent way.

There is no preferred scheme design identified in this document, as the public consultation is intended to help develop this. Instead four example scheme designs are described, that could potentially fulfil the ambitions outlined in the Programme for Government.

These examples are intended to inform the debate by providing evidence on the costs and benefits of different decisions, allowing readers to see how different system components could interact in a complete system. They are not intended to be prescriptive.

Information on the costs of the different potential options is provided by sector or actor type but is not broken down in detail. This is because this includes commercially sensitive information and a number of the costs related to actual implementation will be subject to the final scheme design and negotiation between different stakeholders.

It is possible that following the consultation the preferred final scheme will be a hybrid of the examples, or have an alternate selection on one or more of the components that make up the design. This preferred approach will be subject to the same process as the example scheme designs. This includes promoting evidence led decisions and transparency via the production and publication of a Full Business Case.

Zero Waste Policy
Scottish Government
June 2018.

EXECUTIVE SUMMARY

1. Introduction

This Outline Business Case (OBC) is for Scotland's Deposit Return Scheme (DRS). This OBC does not identify a preferred option but instead describes four example schemes, to help inform discussion around the impacts of different design choices.

The OBC follows on from the Strategic Outline Case (SOC), completed in early 2018. This work commenced following the commitment to introduce a DRS in September 2017, in A Nation with Ambition – The Government's Programme for Scotland 2017-18'. This commitment followed a number of packages of work conducted by Zero Waste Scotland, to establish the merits or otherwise of implementing a scheme in Scotland.

This OBC follows standard HM Treasury guidance and is aligned to both the Green Book and the "5 cases" model.

It should be seen in the wider context of Scotland's transition to a Circular Economy, as described in the Scottish Government's Circular Economy Strategy "Making Things Last". This aligns with the European Commission's own Circular Economy ambitions, as articulated in the Circular Economy Package. This is outlined, and forms the basis of, the **strategic case**.

2. Approach

Following the Treasury "5 cases" model, the approach has been to start with as broad a scope as possible for "developing a DRS for drinks containers for roll-out across Scotland". Stakeholder engagement activities and technical development work was then undertaken to support the development of design options.

The engagement work included 13 x sector workshops (organised with trade associations and federations in each sector) with over 100 participants, 70 strategic conversations with individual organisations, 63 x 1-2-1 interviews and 10 x organisations completing the Scottish Firms Impact Test Questionnaire.

Technical work has included the development of a bespoke Excel model, visiting and accessing data from existing schemes operating in other countries, data gathering and analysis and identifying and purchasing access to existing databases.

This work culminated in a short-list of eight options considered in the SOC, which comprised seven example scheme designs and a "do nothing" option. Four examples have been short-listed as having the potential to fulfil the identified objectives of introducing a DRS and have been modelled, as well as the "do nothing" option as a base case, as part of this OBC.

In addition to following the standard HM Treasury guidance on business cases and being
aligned to both the Green Book and the “5 cases” model, the OBC is consistent with the wider approach taken by the Scottish Government in considering the wider socio-economic impacts of any initiative.

3. Description of Examples

This OBC assesses four example scheme designs alongside the status quo, where no DRS is implemented. The examples are based around 12 components, which combine to deliver all of the functions necessary to operate a DRS. As a minimum the examples all include plastic (Examples 1 and 3 include PET only, Examples 2 and 4 include both PET and HDPE), glass and aluminium and steel cans.

The examples are:

- Example 0 – Do Nothing – used to form a baseline
- Example 1 – Takeback to dedicated drop-off points
- Example 2 – Take back to dedicated drop-off points and some shops (with cartons and cups included)
- Example 3 – Take back to any place of purchase
- Example 4 - Take back to any place of purchase (with cartons and cups included)

Taking a component based approach to constructing these options allows “hybrids” to be created by changing options under individual components. Given the complexity of DRS it is possible that the final system design will be a hybrid of the examples or include an alternate selection in one or more components.

The costs of these examples are initially compared to a scenario where no scheme is introduced (the ‘do nothing’ option). This option assumes that there are no changes to the status quo beyond those introduced by the European Commission’s Circular Economy Package, including full cost recovery from producers. Existing public and private collection methods of drinks containers from households, commercial businesses and on the go locations continue in their current form. On this basis it is clear that not introducing a DRS would:

- Fail to improve recycling quantity
- Fail to improve recycling quality
- Have no impact on wider behavioural change around materials
- Miss opportunities to support Scotland’s transition to a low carbon economy

This is option is required (in line with common practice) to act as a baseline for comparison.

4. The Strategic Case

The Scottish Government's aim of delivering sustainable economic growth is underpinned by five strategic objectives – to make Scotland wealthier and fairer, smarter, healthier, safer and stronger and greener. The introduction of a DRS, as stated in the Programme for Government 2017-18 will make Scotland greener and healthier and also offer economic opportunities by improving the quality and quantity of recycling material available to business.

A DRS contributes to delivery of Scotland's Circular Economy Strategy, "Making Things Last" and the adoption of the European Commission's Circular Economy Package. This includes Scotland's long-term recycling targets, to recycle 70% of all waste by 2025, and principles such as a requirement for 100% cost recovery of recycling costs from producers[1].

The Scottish Government national litter strategy, "Towards A Litter-Free Scotland", focuses on litter prevention. The aim of the strategy is to reduce the estimated £46 million of public money spent removing litter and flytipping from the environment each year. In addition, a sister document, "Marine Litter Strategy" focuses on protecting Scotland's coastal environment.

5. The Socio-Economic Case

The socio-economic case investigates the costs and benefits of the four example system designs. A 25 year Net Present Value (NPV) has been calculated presenting comparable figures against which to assess each of the DRS options, presenting the 'do nothing' option (Example 0) as zero. The costs and benefits in examples 1-4 can then be compared as incremental costs and benefits from this fixed point.

Applying a discount rate of 3.5%, in line with HM Treasury Green Book methodology, the following four tables, present the costs and benefits for different actors and the total NPV for each example:

	EXAMPLE 1: NPV (£)		
Actor	Costs	Benefits	Net benefit
System Operator	-£1,114 million	£2,354 million	£1,240 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,150 million	£0	-£2,150 million
Producers	-£132 million	£800 million	£668 million
Local Authorities	£0	£110 million	£110 million
Commercial Premises	£0	£23 million	£23 million
Other Sectors	-£85 million	£85 million	£0 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£768 million	£768 million
TOTAL	-£3,646 million	£4,140million	£494 million

[1] European Commission's Circular Economy Package

Actor	EXAMPLE 2: NPV (£)		
	Costs	Benefits	Net benefit
System Operator	-£2,086 million	£3,013 million	£927 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,558 million	£0	-£2,558 million
Producers	-£370 million	£1,214 million	£844 million
Local Authorities	£0	£146 million	£146 million
Commercial Premises	£0	£37 million	£37 million
Other Sectors	-£153 million	£155 million	£2 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£1,119 million	£1,119 million
TOTAL	-£5,332 million	£5,684 million	£352 million

Actor	EXAMPLE 3: NPV (£)		
	Costs	Benefits	Net benefit
System Operator	-£1,304 million	£1,304 million	£0
Return Points	-£859 million	£859 million	£0
Unredeemed Deposits	-£545 million	£0	-£545 million
Producers	-£654 million	£890 million	£236 million
Local Authorities	£0	£149 million	£149 million
Commercial Premises	£0	£31 million	£31 million
Other Sectors	-£137 million	£138 million	£1 million
Value of Public Contribution	-£165 million	£0	-£165 million
Society Benefits		£1,038 million	£1,038 million
TOTAL	-£3,664 million	£4,409 million	£745 million

Actor name	EXAMPLE 4: NPV (£)		
	Costs	Benefits	Net benefit
System Operator	-£1,409 million	£1,409 million	£0
Return Points	-£874 million	£874 million	£0
Unredeemed Deposits	-£860 million	£0	-£860 million
Producers	-£446 million	£965 million	£519 million
Local Authorities	£0	£168 million	£168 million
Commercial Premises	£0	£42 million	£42 million
Other Sectors	-£148 million	£149 million	£1 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£1,285 million	£1,285 million

TOTAL	-£3,902 million	£4,892 million	£990 million

Following the NPV analysis, a number of additional impacts have also been identified. It has not been possible to place a financial value on these for the purposes of the OBC. To ensure transparency, these additional costs and benefits have been separated from the NPV and assessed by:

- an indication of the scale of the impact (Significant, Moderate or Minor);
- the likelihood of incorporating these into the NPV value (Probable, Possible or Unlikely) for the Full Business Case; and
- ranking them based on their contribution to these factors in a positive way.

The following summary tables identify each of these factors, grouped into broad criteria, and demonstrate the ranking of each example design against each factor:

	Material Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Improved Material Quality	4	2	3	1
Attracting processing capacity to Scotland or innovation by existing Scottish companies	2	2	2	1
Influencing packaging design	3	2	3	1

	Wider Litter Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Wider Litter Impacts	4	2	3	1
Reduction in propensity to litter	4	3	2	1
Magnified impacts of litter on certain socio-demographic groups	4	2	3	1

	Industry Costs			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Impact on producer operational efficiencies	1	2	1	2
Contribution to Sector Sustainability Strategies	4	3	2	1
Increased footfall for retailers	4	3	2	1

	Collection Efficiencies			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Local Authority Waste Collections	4	2	3	1
Utilising existing facilities	4	2	3	1
Supporting economies of scale in collections	3	2	1	1
Non-Local Authority Litter Savings	4	2	3	1

	Social Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Involvement of 3rd sector in delivery	2	2	2	1
Financial benefits for community organisations	1	2	3	3

	Wider Behaviour Change			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Increase in recycling of non-DRS materials	4	2	3	1
Wider behaviour change messaging	3	2	1	1
Improved data quality and transparency	4	3	2	1

	Other Environmental Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Carbon Pricing	4	3	2	1
Creating a Circular Economy Exemplar	2	2	2	1

Finally, four qualitative criteria have been identified where it is not possible to integrate these into the NPV. It was agreed that a weighing and scoring approach would be taken, to provide a way to assess the relative importance of each criteria and the impact of each example design against these.

The relative importance of each of these criteria was decided through a weighting and scoring workshop which was facilitated by an independent facilitator. These criteria, and the applied weightings, are:

1) Ensure a fairness for all demographic groups e.g. considering the impacts of the deposit level on households on lower incomes (32%)
2) Maximise accessibility to all demographic groups e.g. ensure there is no need to access a private vehicle to redeem deposits (38%)
3) Create employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities. (13%)
4) Create opportunities to raise funds for charitable causes, where use of the money can have wider societal benefits. (17%)

The following table summarises the weighted scores allocated to each example for each of the four criteria and the total:

Criteria	**Example 1**	**Example 2**	**Example 3**	**Example 4**
Criteria 1: Ensure a fairness	25.6	25.6	28.8	28.8

Criteria 2: Maximise accessibility	15.2	22.8	38	38
Criteria 3: Create employment	6.5	7.8	7.8	9.1
Criteria 4: Create opportunities to raise funds	8.5	8.5	8.5	8.5
TOTAL	55.8	64.7	83.1	84.4

This ranking is used in conjunction with the NPV information and additional identified impacts to examine the value for money of the examples.

6. The Financial Case

This section looks at whether the four examples represent a fundable and affordable proposition. The figures are useful as an aid to decision making, demonstrating the likely costs of different approaches. It should be noted that comparison of the differences between the examples on a like for like basis is more important than the absolute figures.

DRS in other countries are generally funded by a mixture of three separate income streams: unredeemed deposits, the sale of materials and a producer fee.

Initial capital costs will be funded by securing a commercial loan or loans from stakeholders. These are usually short term, as they are repaid using unredeemed deposits for containers that enter the supply chain.

The following table summarises the initial capital investment, the operating costs and income streams for the system operator in an example operational year:

Example	Initial Capital Costs	Operating Costs	Unredeemed Deposits	Value of Materials	Producer Contribution
Example 1	£101m	£43m	£126m	£6m	£0m
Example 2	£185m	£74m	£149m	£7.2m	£0m
Example 3	£76m	£67m	£31.5m	£8m	£27.5m
Example 4	£78m	£72.5m	£50m	£8.1m	£14.4m

7. The Commercial Case

This section identifies and evaluates the risks associated with the implementation of a DRS in Scotland.

First the relative scale of the example schemes is compared to existing activity in Scotland, considered on the basis of materials managed. The schemes would manage between 87,000-135,000 tonnes which would place it in the top 10 of Local Authorities[2]. The schemes would employ between 99-816 FTEs, at the higher end

[2] Household Waste Data 2016, SEPA

that would place it in the 2,365 enterprises (excluding central and local government) in Scotland which employed over 250 employees[3].

A comparison was then made with DRS elsewhere, to evaluate whether existing schemes operate in similar sized markets and the range of materials in scope. Looking at Europe, 6 systems operate in similar sized or smaller markets than Scotland. Polyethylene terephthalate (PET Plastic), glass and metals are regularly included in schemes elsewhere. Some schemes in North America include beverage cartons however the full range of materials included under Examples 2 and 4 are not seen elsewhere.

Finally, the commercial risks are evaluated for each example. The commercial risks identified include upfront capital investment, negotiation required to establish the number of required return locations, range and scale of procurement activity, data and information gathering, recruitment, delivery of performance objectives, fluctuations in material values and specifications, potential for fraud and timescales for implementation.

Assessment against these commercial risks resulted in the following overall risk rating for each of the options:

Option	Commercial Risk Rating
Example 1: Takeback to dedicated drop-off points	Medium-High
Example 2: Take back to dedicated drop-off points and some shops (with cartons and cups included)	High
Example 3: Take back to any place of purchase	Medium
Example 4: Take back to any place of purchase (with cartons and cups included)	Medium-High

8. The Management Case

This programme is being managed using the principles of Managing Successful Programmes and PRINCE2 project management. There are three phases:

- Research and evaluate the examples using the Five Case model (Phase 1).
- Carry out a Public Consultation and take decisions on the nature of the DRS to be implemented, and introduce any necessary Regulations and Legislation to be adopted by the Scottish Parliament (Phase 2).
- Implement the DRS (Phase 3).

Outputs from Phase 1, accompanying this OBC, include an Equality Impact Assessment (EQIA), Strategic Environmental Assessment (SEA) and partial Business Regulatory Impact Assessment (BRIA). All of these documents have informed the public consultation, which was launched in parallel to this document.

A governance process has been established to set the strategic direction of the DRS programme, determining the scope of work, and taking decisions on strategic policy

[3] Businesses in Scotland 2017, Scottish Government

as well as monitoring any identified risks. Members of the Programme Board include representatives from Scottish Government (the Board is chaired by the Director of Environment and Forestry), Zero Waste Scotland, Scottish Environment Protection Agency and Highlands & Islands Enterprise.

9. The Next Steps

This OBC accompanies the launch of a public consultation, providing individuals and organisations with an opportunity to inform the final scheme design. Engagement with stakeholders has been vital to getting to this stage and we are committed to continuing this dialogue.

The Scottish Government and Zero Waste Scotland will work together to design a final system. There will be a subsequent opportunity to comment on the design that will be brought forward. Once Scottish Ministers are satisfied with the proposed design, it will be taken forward to super affirmative regulations, which will include an additional forty-day pre-laying period for comment

Accompanying these regulations, a Full Business Case (FBC) will be produced including updated Net Present Value figures. A final BRIA, EQIA and SEA will also be produced, to account for changes in the final scheme design.

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GLOSSARY

Bulking Facility or Site	A facility where materials collected from households or commercial premises are tipped and stored before they are taken elsewhere for recycling or treatment, as appropriate
Climate Justice	An approach for ensuring collectively and individually we have the ability to prepare for, respond to and recover from climate change impacts – and the policies to mitigate or adapt to them – by considering existing vulnerabilities, resources and capabilities
Co-mingled collection	The collection of two or more target materials in a single receptacle for subsequent sorting into separate streams at a material recovery facility
Compositional analysis	Method used to determine and analyse the materials and items that make up the contents of waste and recycling bins
Counting Centre	Location where empty DRS containers, that have been returned manually are counted and verified. They ensure that the retailer who pays out the deposit receives the correct amount in return
Extended Producer Responsibility	Where brand owners and manufacturers take environmental responsibility for the products, and their packaging, that they place on the market when they become waste
Feedstock	The raw material that goes into the production of new materials
Gate fees	Charge levied upon a given quantity of waste received at a waste processing facility
Handling Fee	A fee that is paid to a DRS return location as compensation for accepting back DRS containers. On a long-term basis such fees may also cover expenses related to investments in reverse vending machines, electricity costs, space requirements and staff time
HDPE	High-density polyethylene – most commonly used plastic for milk bottles
Materials recovery facility	A facility where dry recyclable waste is treated to separate that waste into a dry waste stream or streams
Net Present Value	The sum of a stream of future values that have been discounted to bring them to today's value
Non-profit organisation	A company that uses its surplus revenue to further achieve its aims rather than distributing its income to shareholders or members
PET	Polyethylene terephthalate – most commonly used

	plastic for fizzy drink and water bottles
Capture Rate	The percentage of deposit bearing containers placed on the market that the scheme receives back for recycling.
Reverse vending machine	A devise that accepts used drinks containers and refunds the consumer their deposit
Stock Keeping Unit	A product identification code for a store or product, often displayed as a machine-readable bar code that helps to track an item for inventory
Target materials	The materials a DRS aims to collect
Unredeemed deposits	The value of paid deposits that have not been redeemed
Virgin materials	Those materials sourced directly from nature in their raw form

SECTION A: CONTEXT AND INTRODUCTION

1. Context

1.0. In A Nation With Ambition: The Government's Programme for Government, the Scottish Government committed to developing a Deposit Return Scheme (DRS) to increase recycling rates and to reduce littering. A DRS is a system where the consumer pays a small extra amount, the deposit, when purchasing a drink in a single use container and is then refunded the deposit when the container is returned for recycling. A DRS will increase the recycling rate, improve the quality of material collected for recycling and change behaviours around littering.

1.1. Around half of the 2.5 billion drinks[4] containers that are put onto the Scottish market each year are recycled. The containers that aren't recycled end up in landfill, being burnt in energy from waste facilities or littered in our environment potentially ending up in the marine environment around Scotland and beyond.

1.2. Introducing a DRS provides the opportunity for a step change from our throwaway society, in recycling performance of the target container materials and how those materials are managed in Scotland. DRS are common around Europe and the rest of the world including the United States and Canada with around 130 million people having access to a DRS in Europe alone[5]. International experience has demonstrated the potential to capture up to 95% of target materials with those materials being of the highest quality.

1.3. Zero Waste Scotland were asked to examine how a DRS could be implemented in Scotland. This Outline Business Case (OBC) considers four example DRS and the impact these would have on the Scottish economy. The examples are not presented as options but instead are used to stimulate discussion and to demonstrate how different system choices made on the scheme for Scotland can influence a schemes performance. They should not be viewed as exclusive. The final scheme choice may be a hybrid of the schemes that are presented in this OBC and will be the subject of a Full Business Case following the consultation period.

1.4. The role of a DRS in developing the circular economy in Scotland is clear. It links to several policy areas outlined below.

Programme for Government 17-18

1.5. 'A Nation with Ambition[6] – The Government's Programme for Scotland 2017-18', published in September 2017, commits to developing a DRS for drinks containers for roll-out across Scotland. The scheme will be tailored to meet Scotland's specific needs, and with the specific aims of increasing recycling rates and reducing littering. The needs of small retailers were specifically

[4] Includes PET, HDPE, aluminium, steel, glass, cartons and single use cups.
[5] Deposit Systems for One-Way Beverage Containers – A Global Overview; Reloop 2016
[6] A Nation with Ambition: The Government's Programme for Scotland 2017-18

highlighted in the PfG and examples which do not involve them have been developed to inform the consultation.

Making Things Last

1.6. 'Making Things Last', Scotland's first circular economy strategy,[7] sets out the Scottish Government's priorities for moving towards a more circular economy – where products and materials are kept in high value use for as long as possible. This will result in the following benefits to Scotland:

- The environment – cutting waste and carbon emissions and reducing reliance on scarce resources;
- The economy – improving productivity, opening up new markets and improving resilience, with potential savings of £500 million to £800 million per year identified in the food and drink and broader bio-economy sectors; and
- Communities – more, lower cost options to access the goods we need, with opportunities for social enterprise.

1.7. The section on Recycling notes that action is driven by long-term Scottish targets to recycle 70% of all waste, and to send no more than 5% of all waste to landfill, both by 2025. The strategy states that the role that a DRS could play in Scotland will be further considered.

Towards a Litter-Free Scotland

1.8. 'Towards a Litter-Free Scotland[8]: A strategic approach to higher quality local environments', is Scotland's first national litter strategy with a focus on litter prevention. This will be delivered by encouraging people to take personal responsibility by activities related to infrastructure, information and enforcement.

1.9. The aim of the strategy is to reduce the estimated £46 million of public money spent removing litter and flytipping from the environment each year and the wider negative impacts of litter; at least a further £361 million in costs on our society and economy. It will also enable the lost value of resources to be recovered; littered material could be worth at least £1.2 million a year.

Marine Litter Strategy

1.10. 'A Marine Litter Strategy for Scotland'[9], was launched in 2014 as a sister document to 'Towards A Litter-Free Scotland', focused on protecting Scotland's coastal environment as a major resource. This will contribute to collaborations under the OSPAR Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)[10] and the Marine Strategy Framework Directive.

Other legislation and strategies informing our work

[7] Making Things Last, a Circular Economy Strategy for Scotland
[8] Towards a Litter-Free Scotland, Scotland's National Litter Strategy
[9] A Marine Litter Strategy for Scotland
[10] OSPAR Convention

1.11. The introduction of a Deposit Return Scheme for Scotland will contribute to objectives set out in the **Climate Change (Scotland) Act 2009**[11]**, and the Climate Change Plan, Third RPP**[12]**.** The 'Climate Change Plan: Third Report on Proposals and Policies 2018-2032' was published in February 2018. This sets out plans to achieve decarbonise the economy in the period to 2032, making progress towards the target of reducing emissions by 80% by 2050.

1.12. Resource use and waste generation are recognised as key sources of greenhouse gas generation and the Scottish Government reports on progress against both territorial and consumption emissions.

1.13. United Nations Draft Resolutions on **Marine Litter and microplastics**[13] **(2017)** and **Management of Marine Debris**[14] (2014), both reference the role that Deposit Return Schemes can have on preventing the harmful escape of plastics into marine environments.

1.14. In 2015, the Scottish Government signed up to support the **United Nations Sustainable Development Goals**[15]. The ambition behind the goals is to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda. A Deposit Return Scheme will have a positive impact on a number of these goals, most explicitly Goal 12: Responsible Consumption and Production.

1.15. In May of 2018 the **European Commission's Circular Economy Package**[16] was approved. The legislation aims to move supply chains towards a circular economy maintaining the value of products, materials and resources in the economy for as long as possible. This includes more ambitious recycling targets and full cost recovery of recycling costs from producers.

1.1 The nature of this document

1.16. The purpose of this OBC is to articulate why an intervention is required and the objectives of the intervention. It sets out and evaluates a broad range of options for delivery of a DRS for Scotland following Her Majesty's Treasury's guidance on the construction of business cases[17].

1.17. Section A provides the context of this work and the approach undertaken in its completion.

[11] Climate Change (Scotland) Act 2009
[12] Climate Change Plan: The Third Report on Proposals and Policies 2018-2032
[13] The United Nations Environment Programme (December 5, 2017) Draft resolution on marine litter and microplastics
[14] The United Nations Environment Programme (November 7, 2014) Draft resolution on Management of Marine Debris
[15] UN Sustainable Development Goals
[16] European Commission's Circular Economy Package
[17] The Green Book, HM Treasury

1.18. There are many examples of DRS across the world and Section B describes the process that was used to develop the examples for a DRS for Scotland that have been analysed in this OBC. The examples demonstrate how different models of DRS could operate in Scotland.

1.19. Section C applies the five cases approach examining both the socio-economic and financial cases for the presented examples. The four examples presented illustrate how a DRS could operate in Scotland and they are primarily designed to show how choices about the different design components interact, how they deliver against the agreed principles and the financial implications of each example. This section describes the key assumptions, models the costs and benefits of each example and considers the commercial case for each example.

1.20. This OBC considers the strategic, economic, financial, management and commercial cases for the introduction of a DRS in Scotland and sets out how the project and scheme implementation will be developed.

1.21. The OBC, along with the public consultation and the Business Regulatory Impact Assessment (BRIA), Strategic Environmental Assessment (SEA) and Equalities Impact Assessment (EQIA), will be used to inform decision-making by the DRS Programme Board and Scottish Ministers. A Full Business Case (FBC) will be developed once the preferred option has been selected following the consultation.

1.2 The need

1.2.1 Current recycling rate

1.22. Scotland's household recycling rate has increased substantially in the last decade. The latest figures, published in September 2017[18] by the Scottish Environment Protection Agency, confirm that in 2016 the household recycling rate reached 45.2%.

1.23. This has been driven by substantial investment by central and local government in kerbside collections. The result has been a dramatic increase in the number of households who have access to recycling facilities. All 32 Local Authorities are now nearing completion of these rollouts, covering most of the properties in their area.

1.24. However, the rate of growth has been slowing. Since 2014, and the introduction of a new methodology for calculating recycling rates, it has only increased by 2.4%. A complex range of factors contribute to this limited improvement and it is clear that further interventions are required to stimulate growth in recycling rates, to achieve national recycling targets of 70% by 2025.

[18] SEPA 2016 Household Waste Data

1.2.2 Target material recycling rate

1.25. As well as the above observations on the household recycling rate, the recycling rates for those materials potentially within scope of a deposit return scheme demonstrate that there is scope for improvement, as shown in the table below.

1.26. Focusing on drinks containers, there are limitations in the available Scottish specific data in relation to sales, waste by material type and material reprocessing. Zero Waste Scotland estimate the following recycling rates in Table 1 for Local Authority household collection. Local authority tonnages and recycling rates are based on observed weights during compositional analysis[19]. The total "dirty" weight seen in the waste stream in such studies typically exceeds weight estimates for "clean" material placed on market, reflecting contamination such as content residues from use and disposal.

Table 1. Current Local Authority Household Collection of Target Containers

Material	% recycled
Glass drinks containers	59%
Steel drinks containers	46%
Aluminium drinks containers	49%
Plastic (PET) drinks containers	53%
Plastic (HDPE) drinks containers	53%
Cartons	39%
Disposable cups	0%*

*Disposable cups did not exist as a separate category in the analysis.

1.27. Plastic bottles, glass bottles, metal cans and beverage cartons are widely recycled, either in kerbside collections or via recycling points and centres. Despite this, there is clearly scope for improving recycling rates, with the best performing DRS in the world achieving capture rates of up to 95%.

1.28. Single use cups are an area which has attracted high profile coverage in the media, especially "coffee cup" style containers consisting of a paper cup with a plastic and/or metal foil lining. These are most frequently used in quick service restaurants, coffee shops and food takeaway shops and so are consumed on the go. These types of cups can potentially be recycled with collections for beverage cartons.

1.29. It is worth noting here that a DRS operates to collect "single use" drinks containers and not "refillable" containers. Across many countries in Europe organised schemes for "refillable" glass bottles are also in operation. These schemes are logistically and commercially separate from DRS but where both

[19] The Composition of Household Waste at the Kerbside 2014-15, Zero Waste Scotland

types of scheme are present in the same nation (e.g. in Finland) they often work alongside each other.

1.30. Refillable schemes utilise a standard glass bottle design and industry participants also agree standard collection crate designs, shared logistics and infrastructure arrangements (such as bottle washing and refilling facilities) amongst themselves. Such schemes usually include brewers and soft drink companies covering a specific range of products. There may be scope for such a scheme to be developed in Scotland in the future, in addition to a DRS. The potential for such would be dependent on a suitable collaboration of industry participants and the availability of the right infrastructure. However, a refillables scheme is out of scope for this programme.

1.2.3 Quality of end-materials

1.31. As well as assessing the amount of targeted material collected, it is also important to consider the end destination for those materials. A true "circular economy" approach is one where the quality of material collected is high enough, that it can displace virgin materials (e.g. plastics made from oil, or aluminium made from bauxite) in high value uses.

1.32. As noted above, detailed data specifically on Scottish waste materials often does not exist. However, the majority of these materials are currently collected co-mingled i.e. mixed together with other household packaging. For glass, even where it isn't co-mingled with other materials, collecting it mixed makes it more difficult to separate different colours.

1.33. So, while the majority of a material type is being collected, the overall amount suitable for high value recycling may be much less. This is a result of contamination from other comingled materials, and/or the cost of separating materials to achieve a high value being uneconomic.

1.2.4 Litter

1.34. The costs of litter, both direct and indirect, are identified earlier in this report (Section 1, Context). Zero Waste Scotland[20] has identified the average composition of the litter stream in Scotland.

1.35. The categorisation doesn't differentiate between drinks containers and other containers but the following breakdown, by weight, was identified: plastic bottles (9%), glass bottles (9%) and metal cans (4%). It isn't possible to identify beverage cartons, pouches or single use cups within the categories used.

1.36. With the indirect costs of littering, such as the negative impacts it has on local areas through visual disamenity, looking at the volume of materials gives a more accurate indication of its impact than looking at the percentage

[20] Scotland's Litter Problem, Zero Waste Scotland

weight. Measured by volume, drinks containers would make up a greater proportion of the litter stream than indicated above.

1.37. The Marine Conservation Society's Great British Beach Clean 2017[21] provides a breakdown of the sources of litter and types of materials found. Over 30% of material is littered by the public and 46% remains unsourced, primarily because it has broken down into fragments too small to identify. Glass and container caps & lids both appear in the top 10 items found in these surveys.

1.2.5 Economic opportunity

1.38. Both Scotland's Economic Strategy[22] and Manufacturing Action Plan[23], recognise the economic opportunities presented by "Making Things Last". Creating the conditions for a more circular economy helps companies embrace new business models and manufacturing processes and transforms used products into assets. In addition to ensuring that the lifecycle of all resources is maximised, this approach also helps to protect against increased volatility and vulnerability in the supply of raw materials.

1.39. A DRS provides opportunities as an exemplar of circular business practices, maximising the financial value of secondary resources to Scotland and creating a potential high value feedstock for industry in Scotland. The system operator will provide a key central point of contact for businesses looking to source high quality recyclate.

1.3 Link between the outline business case and options appraisal

1.40. This document is written as a formal OBC but it also provides a record of the Stage 2 appraisal of options for the introduction of a deposit return scheme in Scotland. The approach is based on HM Treasury's Green Book[24].

1.41. The appropriate method for an options appraisal under the approach common in Scotland is a neutral document that provides the evidence base for decision making but does not itself make the decision. This Five Case Appraisal informs Section C of this OBC document. Section D (Next Steps) does not impose value judgements or reach a decision and proposes how the findings of the Five Cases appraisal could be taken forward.

1.42. The standard approach within an options appraisal is to compare options, or in the case of this OBC a number of examples, for an intervention against a base case when no action is taken. This is referred to as a "do-nothing" or a "do-minimum" example. This assumes a business as usual scenario where

[21] MCS Great British Beach Clean
[22] Scotland's Economic Strategy, March 2015
[23] A Manufacturing Future for Scotland
[24] The Green Book, HM Treasury

the Circular Economy Package is adopted, requiring enhanced cost recovery from industry. This example is the basis of the cost model detailed in Section C. This example does not deliver the strategic outcomes sought by the introduction of the DRS but provides a comparator on the costs, and therefore the basis by which the costs of the other four examples are assessed to demonstrate the value for money of the intervention.

1.43. The nature of DRS and the benefits its introduction will have in Scotland means that a standard cost-benefit approach is not in itself sufficient to provide the information that is required to rigorously assess and compare the examples presented in Section B from one another. This is demonstrated at the start of the Socio-Economic case – a standard Cost-Benefit analysis of the examples has been undertaken and this has been complimented by a multi-criteria approach (MCA) which provides a broad overview of the evidence to inform the socio-economic case where quantification has not been possible. This includes the scoring of a number of qualitive metrics that cannot be readily converted into a financial value. There are also a number of wider benefits where a financial value could not be validated for use in the cost-benefit analysis.

1.44. The following principles by which the DRS examples will be compared, as set by the Programme Board are:

- Increase the quantity of target materials collected for recycling;
- Improve the quality of material collected, to allow for higher value recycling;
- Encourage wider behaviour change around materials;
- Deliver maximum economic and societal benefits for Scotland.

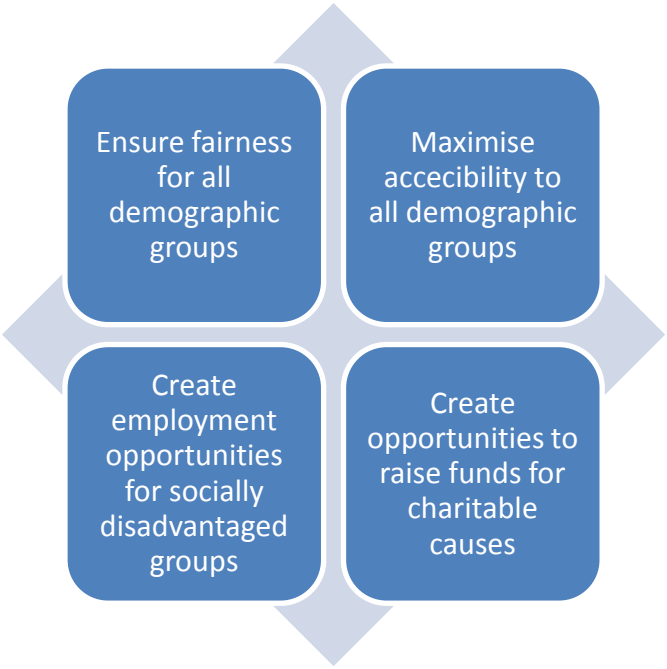
1.45. The focus of the Economic Case is to provide economic analysis of the four DRS examples. Net Present Value (NPV) over 25 years has been used to place a quantitative value on the scheme under each of the examples, allowing the examples to be compared against one another, as seen in Section C. NPV is defined as the sum of a stream of future values that have been discounted to bring them to today's value[25]. While the principles are measured by a value within the NPV, not all benefits and costs can be monetised and so in parallel a complimentary multicriteria analysis (MCA) has been carried out.

1.46. The MCA assesses the qualitative attributes of a DRS with regards to principle 4 to: *deliver maximum economic and societal benefit for Scotland*. This principle is partly measured by a value within the NPV, however there are elements which are not readily convertible into a financial value. As such this principle has been split into four criteria, as shown in Figure 1, and a weighing and scoring method was used to allow a quantitative value to be assigned to these qualitative measures so they can be presented alongside the NPV. The MCA is fully discussed in Section C.

1.47. A separate Financial Case sets out the cash requirements for the various options and the extent to which they would be self-funding/rely on contributions from producers.

[25] The Green Book, HM Treasury

Figure 1 - Criteria used in MCA



1.4 Scale, approach to options and challenge

1.48. A DRS for Scotland is being introduced on a national scale, and as such will impact on all members of society, in all regions of Scotland, when purchasing a drink in a container. DRS will impact on those in the supply chain, including retailers, drinks producers, hospitality premises, the resource management industry, Local Authorities, the drinks packaging sector and those in the logistics and distribution industry.

1.49. In 2016, the Norwegian DRS operator, Infinitum, collected 466,793,339 cans and 545,397,194 bottles labelled with the Norwegian deposit symbol[26]. It is estimated that 1.7 billion containers[27] (PET plastic bottles, glass bottles and steel and aluminium cans) are currently placed on the Scottish market, and could be subject to the DRS. A Scottish DRS will have a significant impact on those in the supply chain, on members of society and on the huge number of items it may apply to. This shows the scale and importance of the decision over the type of scheme introduced.

1.50. A "long list" of DRS options (herein referred to as 'examples') is presented in the Strategic Outline Case (SOC) which has been published as a separate document. This list was designed to ensure that the widest possible range of options and variants were considered. Each of the options was considered against the four principles. This process highlighted that a number of the examples would not be capable of delivering the required outcomes for each

[26] https://infinitum.no/english/deposit-facts-of-2013
[27] Analysis of market data purchased by ZWS as part of the modelling process

principle. This resulted in a “short list” of examples which are taken forward in this OBC as Examples of scheme design. In this OBC the NPV of a “short list” of examples is calculated and performance against a series of qualitative criteria is assessed.

1.5 The five-case model and the development of a short list of examples for deposit return scheme

1.51. The Five Case Model is a framework for thinking about how interventions can be best delivered. It is relevant to the development of policies and strategies in terms of three basic questions:

- Where are we now?
- Where do we want to be?
- How are we going to get there?

1.52. The business case provides evidence that:

- The intervention is supported by a compelling case for change – the “strategic case”;
- The intervention represents best public value – the “economic case”;
- The proposed deal is attractive to the market, can be procured and is commercially viable – the “commercial case”;
- The proposed spend is affordable – the “financial case”; and
- What is required from all stakeholders is achievable – the “management case”.

1.53. The Five Case Model can be used for the development of the:

- Strategic Outline Case (SOC) to be used in support of an investment which has been identified within a strategy and/or its supporting programme/project. It makes the case for change and refines the long list of options into a shortlist;
- Outline Business Case (OBC) – *this paper* - to be used in support of an investment. This builds on the SOC, which has been completed and approved, to confirm the solution which offers optimal value for money; and
- Full Business Case (FBC) to be used in support of an investment. This builds on the OBC, which should have been completed and approved, and takes the chosen option through procurement putting in place delivery plans and providing the final detailed costing.

1.54. These three key phases in the development of the business case constitute milestones when approval may be needed to go further. During its infancy, the key deliverable is the SOC, in its adolescence, the OBC; and finally, when the solution has reached maturity, the FBC.

1.55. A Programme Board has been established and is responsible for setting the strategic direction of the DRS programme, determining the scope of work, and taking decisions on strategic policy as well as monitoring any identified risks. The board provides strategic oversight on the programme of work.

1.56. The SOC for the introduction of a DRS in Scotland was approved by the DRS Programme Board on 19 April 2018. It was agreed that the examples to be taken forward into this OBC are:

Example 0 - No scheme is introduced (as a 'Base Case')
Example 1 - Take back to dedicated drop-off points
Example 2 - Take back to dedicated drop-off points and some shops (with cartons and cups)
Example 3 - Take back to any place of purchase
Example 4 - Take back to any place of purchase (with cartons and cups)

1.57. These examples are explained, further considered and evaluated in the following sections of this OBC. This includes discussion on the design components which make up the examples presented here.

SECTION B: DESCRIPTIONS OF THE EXAMPLES

2. Capabilities needed to deliver a deposit return scheme in Scotland

2.0. Based on the requirements of any DRS, the following functions are required for the scheme in Scotland:

- Administration of cash deposits on drinks containers,
- New collection points for drinks containers (either at dedicated drop-off points or place of purchase),
- Management of material collections from new collection points,
- Administration of handling fees or provision of staff for collection points,
- Administration of fraud detection and potential development of a Scottish label,
- Education and awareness of users about participation in the system,
- Regulation of the system.

2.1. Regardless of the final system design taken forward for the DRS, most of these functions will be needed. The majority of these functions in other countries are managed by an appointed system operator, usually in the form of a not for profit company. Some critical aspects are however retained by Government or other organisations; such as setting the deposit level and external regulation. What differs between the examples is who delivers these functions, how these functions operate within the existing landscape of Scottish public and private sector waste services and the level of contribution by the various actors involved in the operation of the scheme.

2.1 Examples

2.2. For the purposes of developing an Outline Business Case, scheme design examples 0,1, 2, 3 and 4 are to be taken forward.

2.3. The shortlist of examples is described below:

0. **No Scheme is introduced**
1. **Take back to dedicated drop-off points**
2. **Take back to dedicated drop-off points and some shops (with cartons and cups)**
3. **Take back to any place of purchase**
4. **Take back to any place of purchase (with cartons and cups)**

2.4. Each of the five examples in the OBC sets out a view of what the future delivery of the functions outlined above could look like after an example has been fully implemented and is operating effectively. They are based upon the 12 components as outlined in the SOC:

- Materials in Scope
- Products in Scope
- System Performance
- Return Locations
- Financing Model
- Consumer Information
- Fraud Prevention
- Deposit Level
- Infrastructure & Logistics
- Additional Benefits
- System Ownership
- System Regulations

2.5. The examples are not presented as options but instead are used to stimulate discussion and to demonstrate how different system choices made on the scheme for Scotland can influence a schemes performance. It is possible that any final design will be a hybrid of the examples or have an alternate selection on one or more components following on from the consultation.

2.6. It is standard practice to include a 'do-nothing' or "do-minimum" option against which all costs will be compared. The four examples are compared to a do-nothing or *status quo* option and for each scheme the following is determined:

- What the scheme does,
- What the scheme does not do,
- What changes occur to the *status quo,*
- What the scheme would look like practically.

2.7. The examples are examined in detail in the following section. Infographics of each of the examples are available in Annex A.

2.2 Detailed description of the short-list examples

Example 0 - No scheme is introduced

2.8. This is the de-minimis example which will enable the assessment of the impact of a DRS. It is assumed that there are no changes beyond those introduced by the circular economy package and existing public and private collection methods of drinks containers from households, commercial businesses and on the go locations continue in their current form. Full cost recovery from producers, as required by the circular economy package is incorporated. Not introducing a deposit return scheme would:

- Fail to improve recycling quantity
- Fail to improve recycling quality

- Have no impact on wider behavioural change around materials
- Miss opportunities to support Scotland's transition to a low carbon economy

2.9. This is option is required (in line with common practice) to act as a baseline for comparison.

Example 1 – Takeback to dedicated drop-off points

2.10. Example 1 involves containers being taken back to a number of large, dedicated locations, rather than there being lots of smaller return points in shops and public places.

What this example would look like

2.11. This system would see 1,058 deposit return points being placed in towns with a population of at least 1,000 where you can return some types of plastic bottles, aluminium and steel cans and glass bottles to get back the deposit you were charged for the container when you bought it. In this example we have assumed the type of plastic bottles would be ones made of a plastic called PET, which is the most common kind for fizzy drinks and bottled water, and also the most commonly captured by DRS internationally.

2.12. The place where you return things would be similar to a recycling point, where the deposit return machines are placed in a range of public locations such as recycling centres or public car parks.

2.13. Under this example, shops selling drinks in containers wouldn't have to take the containers back. There would simply be a few drop-off points in most towns where you could choose to return your drinks containers.

Who would run it

2.14. In this example, it is assumed that the drinks industry would work together to create a not for profit organisation that would run the DRS. This organisation would make sure the system runs properly, and some of the money made by the deposit system would pay for staff needed to run the system and the costs involved in running it.

2.15. The new organisation would need to run the network of dedicated drop-off points, collect in the deposit money from producers, refund the deposits when containers are returned, and make sure all the containers were collected for recycling.

The effectiveness of these types of systems elsewhere in the world

2.16. Systems like this in North America and Australia tend to see around 60% of drinks containers being recycled and this is the DRS capture rate modelled in this example. It is important to note that the true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

The benefits and drawbacks of the example

2.17. While this offers the lowest return rate of the four examples, it minimises impact on retailers and other businesses.

2.18. There are drawbacks to this approach. If the dedicated drop-off points are not located in major shopping areas or are otherwise central, people could find themselves making a special trip to return their containers rather than doing it as part of their normal shopping pattern. This reduces the accessibility of the system, particularly for disabled or elderly people. If the return point is away from a town or city centre, it would also be inaccessible for people without cars and could also lead to increased emissions if people have to drive to it.

2.19. This is particularly true for rural areas, as people could find their nearest return point is in a town that is hard for them to get to, particularly if they are transporting a large number of returnable containers. Not being able to access a return point for long periods, if it is hard to reach, will also mean they will have to store a large number of containers at home.

2.20. This example has been modelled with a 20p deposit level which reflects the need for a sufficient deposit rate to achieve a reasonable return rate and compensate for the lower accessibility of the system.

2.21. Limited access to the return points might also mean that if someone buys a drink from a retailer and consumes it 'on the go', the container would be more likely to be improperly disposed of – i.e. thrown in a bin or littered.

2.22. The estimated likely return rate for containers in this example is 60%, which is only a marginal improvement on current assumed recycling for these materials. It is therefore questionable whether introducing a deposit return scheme on this basis would be justified as it will not achieve Scotland's ambitions on recycling rates.

2.23. Additionally, the 60% capture rate is assumed to apply equally to both existing residual and recyclate streams, across all sectors. In calculating overall recycling and carbon benefits, remaining recyclate is then also factored in to consideration of net recycling. This may significantly overstate the additionality of this scenario against these criteria, if in fact a greater proportion of DRS capture is diverted from existing recyclate streams, and less from residual.

2.24. The modelling suggests that this option would generate a financial surplus given the large number of unreturned deposits.

Example 2 - Take back to dedicated drop-off points and some shops (with cartons and cups included)

2.25. Example 2 is a similar system to Example 1 but it would have 2,009 return points, as some shops may also have to have deposit return points where there isn't a recycling point style dedicated drop-off nearby. It would also collect a wider range

of container materials in addition to those in Example 1; HDPE, which is the kind of plastic that milk bottles are made of, cartons and disposable cups.

What this example looks like

2.26. This system would see deposit return machines being placed within a set distance of any shop selling drinks in containers, so that there would be somewhere nearby that people could return the containers to get back the deposit they paid when they bought it.

2.27. It would cover more types of plastic bottles than Example 1, as well as aluminium and steel cans, drinks cartons, glass bottles and some single use cups like coffee cups. This example would cover PET plastic, which is the kind that fizzy drinks and bottled water are usually made of, and a type of plastic called HDPE which is the kind that milk bottles are usually made of.

2.28. In this example, shops that sell a high amount drinks in disposable containers would need to make sure there was a place to get the deposit back within a set distance. If there wasn't a public recycling point style dedicated drop-off point within that distance, then the shop would have to have a way to return your deposit to you in the store.

Who would run it

2.29. In this example, it is assumed that drinks companies and retailers would work together to create a not for profit organisation that would run the deposit return scheme. This organisation would make sure the system runs properly, and some of the money collected by the deposit system would pay for staff needed to run the system and the costs involved in running it. The difference in Example 2 is that shops would also have a part to play in making sure there is somewhere to get your deposit back nearby.

2.30. The new organisation would need to run the network of dedicated drop-off points, collect in the deposit money, refund the deposits when containers are returned, pay retailers a handling fee and reimburse deposits they have refunded as appropriate and make sure all the containers were collected for recycling.

The effectiveness of these types of systems elsewhere in the world

2.31. Systems like this in California, Maine and British Columbia can see around 80% of drinks containers being recycled. Given Scotland's geography we assumed a slightly lower rate of return, 70%, than the optimal rates achieved elsewhere in the world. It is important to note that the true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

2.32. The modelling we have undertaken in developing this Outline Business Case assumes that DRS materials are removed equally from the current recycling stream

and current residual stream. The model treats all our scenarios equally in this respect but at lower performance rates, or for materials with higher baseline recycling rates, it may in practice be more likely that material disproportionately comes from existing recycling streams. If this is indeed the case, the net recycling gain and associated carbon benefit for this scenario might be overstated when assessed on these two criteria.

The benefits and drawbacks of the example

2.33. This example offers a higher return rate for drinks containers than Example 1. It also limits the impact on retailers but not to the same extent as Example 1 as some retailers may be required to provide return points, or take back in store, if there are no dedicated drop-off points nearby.

2.34. It also goes some way towards solving the problem of accessibility as there would be a larger number of return points, potentially in more convenient locations. This could still limit access to the system for people in rural areas, if their local shops do not sell a high enough volume of drinks to warrant having take-back on their premises or close by.

2.35. As with Example 1, this example has been modelled with a 20p deposit level which reflects the need for a sufficient deposit rate to achieve a reasonable return rate and to compensate for the lower accessibility of the system.

Example 3 – Take back to any place of purchase

2.36. Example 3 is an example where you would be able to take your drinks containers back to any retailer that sells drinks in disposable containers.

What this example looks like

2.37. This example would mean that any retailer that sells drinks in disposable containers would have to provide a deposit return service so you can get back the deposit you paid on the container when you bought the drink. You would be able to take your container back to any of these 17,407 retailers – it wouldn't have to be the same one you bought the drink from. It would mean there would be a lot more places where you could claim your deposit back in your local area, compared to Examples 1 and 2.

2.38. Bigger retailers may have machines to collect the bottles and cans, and return people's deposits. Smaller retailers with less space could return deposits over the counter, collecting the containers manually.

This example would cover some types of plastic bottles, aluminium and steel cans and glass bottles. We have assumed that the type of plastic bottles would be ones made of a plastic called PET, which is the most common kind for fizzy drinks and bottled water.

Who would run it

2.39. Similar to Examples 1 and 2, it is assumed that the drinks industry and retailers would work together to create a not for profit organisation that would run the deposit return scheme. This organisation would make sure the system runs properly, and some of the money made by the deposit system would pay for its staff and running costs. It would need to collect in the deposit money and arrange for handling fees and deposits to be reimbursed to return points to cover the cost of running these. It would also ensure containers are picked up from retailers regularly and recycled.

2.40. Retailers that sell drinks in disposable containers would have to provide a system in store to give people back the deposits on any drinks containers covered by the system (PET plastic, cans and glass bottles).

The effectiveness of these types of systems elsewhere in the world

2.41. Systems like this in Scandinavia and the Baltic states are seeing up to 95% of drinks containers being recycled. We have modelled a return rate of 80% for this example given the deposit level of 10p. It would be anticipated that a higher deposit level would increase the return rate.

2.42. It is important to note that the true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

The benefits and drawbacks of the example

2.43. This example offers the highest return rate for containers in scope. As it has the highest return rate for the target containers, it most closely matches the environmental ambitions of the policy of increasing the recycling rate and reducing littering.

2.44. It would have an impact on retailers, through either loss of selling space if they install a reverse vending machine (RVM) or staff time if they take back manually over the counter, plus the requirement to store containers until they are collected. The system would offer a 'handling fee' paid per container returned to reimburse shops for the use of staff time and retail space.

2.45. A return to retail system would also be the most accessible. If every retailer either has a reverse vending machine or takes back over the counter, people will be able to return their containers as part of their normal purchasing routine. Even if customers chose to make a special trip to return their containers, the density of return points means it is likely they will not have to travel far to find one.

Example 4 - Take back to any place of purchase (with cartons and cups)

2.46. Example 4 is similar to Example 3, where you would be able to take your drinks containers back to any shop that sells drinks in disposable containers. The difference is that Example 4 would collect a wider range of drinks containers and would be jointly run by a public body and the drinks/retail industry.

What this example looks like

2.47. This system is similar to Example 3, and would mean that any shop that sells drinks in disposable drink containers would have to provide a deposit return service so you can get back the deposit you paid on the container when you bought the drink. You would be able to take your container back to any of these shops – it wouldn't have to be the same one you bought the drink from.

2.48. The difference with Example 4 is that it would collect a wider range of drinks containers. It would collect PET plastic, which is the kind that fizzy drinks and bottled water are usually made of, and a type of plastic called HDPE which is the kind that milk bottles are usually made of. It would also collect aluminium and steel cans, drinks cartons, glass bottles and some single use cups like coffee cups.

Who would run it

2.49. This example assumes that an organisation made up of a public body and leaders from the drinks and retail industries would be set up to run the system. This organisation would make sure the system runs properly, and some of the money made by the deposit system would pay for its staff and running costs. It would need to collect in the deposit money and arrange for handling fees and deposits to be reimbursed to return points to cover the cost of running these. It would also ensure containers are picked up from retailers regularly and recycled.

2.50. Shops that sell drinks in disposable containers would have to provide a system in store to give people back the deposits on any drinks containers covered by the system (PET and HDPE plastic, cans, drinks cartons, glass bottles and cups).

The effectiveness of these types of systems elsewhere in the world

2.51. This would be a uniquely ambitious system for Scotland as nowhere else in the world collects this range of material via a DRS. We have modelled a return rate of 80% for this example given the deposit level of 10p. It would be anticipated that a higher deposit level would increase the return rate. This means the system would be collecting a much wider variety of materials at a high rate, offering the highest possible capture rates and litter reduction.

2.52. It is important to note that the true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

The benefits and drawbacks of the example

2.53. As noted above, this would not only achieve a high capture rate for the materials included in Example 3, it is likely it would also help tackle a range of other materials, increasing the rate of recycling and preventing them from becoming litter.

2.54. Some of these items are harder to recycle, however one of the main obstacles to these materials being recycled is that they are not available separately to other

materials in sufficient amounts to make recycling them cost effective. This would be addressed in a DRS. However, greater attention would need to be devoted to ensuring sufficient recycling infrastructure was in place for items that are not currently widely recycled.

2.55. As with Example 3, this would also offer improved accessibility due to the high level of return points in both rural and urban locations and the fact that these return points will be where people will be going to shop. It would have the highest impact on retailers, through either loss of selling space if they install a reverse vending machine or staff time if they take back manually, plus the requirement to store containers until they are collected.

2.3 Summary

2.56. Each of the examples provide the functions needed to operate the DRS. The difference in the scheme examples is primarily about the materials being captured, how return points are provided to the public, and who will provide these functions and how. Under all examples some functions are provided by the Scottish Government (or its agencies) e.g. in terms of, regulation, and the rest by industry although Example 4 assumes greater government involvement than the others. The deposit level varies between 10p and 20p between the examples. In practice any of the examples could have a higher or lower deposit than modelled in the OBC. The higher the deposit level the greater the expected return rate for containers, however this needs to be balanced against other system choices such as the increased likelihood for fraud.

2.57. The next section of the report looks at the costs of each of the examples.

SECTION C: FIVE CASES

3. The strategic case

3.1 Overview

3.0. In the standard Five Case approach the Strategic Case should demonstrate that the spending proposal provides business synergy and strategic fit and is based on a robust and evidence based case for change. This includes the rational of why intervention is needed, as well as a clear definition of outcomes and the potential scope for what is to be achieved.

3.1. The strategic case is about demonstrating how the spending proposal fits in relation to national, regional and local policies, strategies and places and furthers the required outcomes. In this section we repeat some of the relevant information already contained in the context section above.

3.2. At a strategic level, the Scottish Government aim of delivering sustainable economic growth is underpinned by five strategic objectives[28] – to make Scotland wealthier and fairer, smarter, healthier, safer and stronger, and greener. The introduction of a DRS, as stated in the Programme for Government 2017-18 will make Scotland greener and healthier and offer economic opportunities by improving the quality and quantity of recycling material available to business.

3.3. The above strategic objectives are supported by 16 National Outcomes[29]. The strategic business case for the introduction of a DRS for Scotland will deliver on National Outcomes 12 and 14:

- **We value and enjoy our built and natural environment and protect it and enhance it for future generations.**
- **We reduce the local and global environmental impact of our consumption and production.**

3.4. The introduction of a DRS has the potential to provide significant benefits to Scotland. These benefits will be environmental, economic and social.

3.5. Support amongst the public for the introduction of a DRS is high, with a recent poll for ITV Tonight (2,000 people, UK) indicating that 75% of people would support an introduction of such a scheme[30]. A separate survey of more than 2,000 British adults commissioned by SUEZ in March 2018[31] also reported that 74% of consumers would be likely to return plastic bottles and aluminium cans under a DRS.

[28] Strategic Objectives, Scottish Government
[29] National Outcomes, Scottish Government
[30] Plastic: Can you live without it? – ITV, February 2018
[31] YouGov, March 2018

3.6. In terms of circular economy benefits, this approach could help to target "leaks" (where the material is discarded and no longer retained in the circular loop) of valuable resources, maximise its value and ensuring it becomes an important feedstock for high value manufacturing. This will maximise the economic impact for Scotland and create employment opportunities across a range of roles.

3.7. As a form of Extended Producer Responsibility, as defined by the OECD, a DRS is "an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle"[32]. It is important that these are proportionate to the benefits gained and look to mitigate any unintended consequences on any actors through scheme design.

3.8. To realise these benefits and minimise the challenges, it is necessary to design a scheme tailored to Scotland's geography, population distribution and economic, environmental and social ambitions.

3.9. As discussed in the context section the European Commission's Circular Economy Package aims to move supply chains towards a circular economy maintaining the value of products, materials and resources in the economy for as long as possible. This introduces more ambitious recycling targets for packaging materials and full cost recovery of recycling costs from producers.

3.2 Strategy & aims

3.10. A Nation with Ambition – The Programme for Scotland 2017-18, published in September 2017, commits to developing a DRS for drinks containers for roll-out across Scotland to create a cleaner, greener and healthier Scotland by supporting the circular economy and tackling climate change. The scheme will be tailored to meet Scotland's specific needs, and with the specific aims of increasing recycling rates and reducing littering.

3.3 Other related strategies

Making Things Last:

3.11. Scotland's first circular economy strategy[33] sets out the Scottish Government's priorities for moving towards a more circular economy – where products and materials are kept in high value use for as long as possible. This will result in the following benefits to Scotland:

- The environment – cutting waste and carbon emissions and reducing resilience on scarce resources;

[32] Organisation for Economic Co-operation and Development, Extended Producer Responsibility
[33] Making Things Last, a Circular Economy Strategy for Scotland

- The economy – improving productivity, opening up new markets and improving resilience, with potential savings of £500 million to £800 million per year identified in the food and drink and broader bio-economy sectors; and;
- Communities – more, lower cost options to access the goods we need, with opportunities for social enterprise.

3.12. The section on recycling notes that action is driven by long-term Scottish targets to recycle 70% of all waste, and to send no more than 5% of all waste to landfill, both by 2025. The strategy states that the role that a DRS could play in Scotland will be further considered.

Towards a Litter-Free Scotland:

3.13. Towards a Litter-Free Scotland[34] is Scotland's first national litter strategy with a focus on litter prevention. This will be delivered by encouraging people to take personal responsibility by activities related to infrastructure information and enforcement.

3.14. The aim of the strategy is to reduce the estimated £46 million of public money spent removing litter and flytipping from the environment each year and the wider negative impacts of litter; at least a further £361 million in costs on our society and economy. It will also enable the lost value of resources to be recovered; littered material could be worth at least £1.2 million each year.

Marine Litter Strategy:

3.15. A Marine Litter Strategy[35], was launched in 2014 as a sister document to Towards a Litter-Free Scotland, focused on protecting Scotland's coastal environment as a major resource. This will contribute to collaborations under OSPAR Convention[36] and the Marine Strategy Framework Directive.

Other legislation and strategies informing our work

3.16. The introduction of a deposit return scheme for Scotland will contribute to objectives set out in the **Climate Change (Scotland) Act 2009**[37]**, and the Climate Change Plan, Third RPP**[38]. The 'Climate Change Plan: Third Report on Proposals and Policies 2018-2032' was published in February 2018. This sets out plans to achieve decarbonise the economy in the period to 2032, making progress towards the target of reducing emissions by 80% by 2050.

3.17. Resource use and waste generation are recognised as key sources of greenhouse gas generation and the Scottish Government reports on progress against both territorial and consumption emissions.

[34] Towards a Litter-Free Scotland, Scotland's National Litter Strategy
[35] A Marine Litter Strategy for Scotland
[36] OSPAR Convention
[37] Climate Change (Scotland) Act 2009
[38] Climate Change Plan: The Third Report on Proposals and Policies 2018-2032

3.18. United Nations Draft Resolutions on **Marine Litter and Microplastics**[39] **(2017)** and **Management of Marine Debris**[40] (2014), both reference the role that deposit return schemes can have on preventing the harmful escape of plastics into marine environments.

3.19. In 2015, the Scottish Government signed up to support the **United Nations Sustainable Development Goals**[41]. The ambition behind the goals is to end poverty, protect the planet and ensure prosperity for all as part of a new sustainable development agenda. A deposit return scheme will have a positive impact on a number of these goals, most explicitly Goal 12: Responsible Consumption and Production.

3.4 Principles

3.20. The introduction of a DRS has four overall principles:

1. Improving recycling quantity.
2. Improving recycling quality.
3. Encouraging wider behaviour change around materials.
4. Delivering maximum economic and societal benefit for Scotland during the transition to a low carbon world.

Principle 1 – Increasing recycling quantity

3.21. Measures in this area relate to improving the overall quantity of material collected for recycling and therefore diverted from landfill, energy from waste or becoming litter. The specific criteria proposed are:

- Increase the tonnage and percentage of targeted materials recycled.
- Increase the total amount of material collected for recycling in Scotland i.e. avoiding any unintended consequences that result in a reduction of other materials being collected for recycling.

3.22. The effect of these measures is a change in disposal costs, which may be positive or negative, for a range of actors across Scotland. The most significant impact will be on local authorities and private waste management operators, as they handle the largest tonnage of materials.

3.23. There will also be an impact on organisations who have their waste collected, where either this is charged by weight or where there is a significant drop in volume, allowing a change in container size or frequency of collection.

[39] The United Nations Environment Programme (December 5, 2017) Draft resolution on marine litter and microplastics
[40] The United Nations Environment Programme (November 7, 2014) Draft resolution on Management of Marine Debris
[41] UN Sustainable Development Goals

3.24. Examples of potential changes include: lower collection costs for businesses, lower disposal costs for local authorities due to less material going to landfill, higher gate fees for co-mingled recycling for local authorities and a loss of revenue for waste management companies servicing their commercial customers.

3.25. There are other benefits associated with diverting a larger quantity of material from these other disposal routes and these are captured under the other principles.

Principle 2 – Increasing recycling quality

3.26. Measures in this area relate to improving the quality of material generated in Scotland, maximising its economic value as a feedstock for high value manufacturing activities. The specific measures proposed are:

- Increase the tonnage and percentage of targeted materials suitable for high value recycling.
- Increase the total amount of material collected in Scotland that is suitable for higher value recycling i.e. ensuring that other material currently achieving this goal is not diverted to lower value recycling.

3.27. The effect of these two measures should be a larger amount of the targeted material achieving high value recycling and this quality being achieved in Scotland. The impact is that industry in Scotland either benefits from the higher value through use of this feedstock or generates higher income by selling it.

Principle 3 – Encouraging wider behaviour change around materials

3.28. Measures in this area relate to the indirect benefits on material use and disposal by the introduction of a DRS. These go beyond changing the value of the disposal route and value of materials. The proposed criteria are:

- Reduce the quantity of single use beverage containers that are littered by the public.
- Encourage “circular” product design by beverage packaging producers e.g. making packaging lighter, increasing recycled content in containers, or designing for increased recyclability.
- Enable education and engagement on key circular economy messages and challenging aspects of our throwaway society e.g. utilising advertising space at return points.

3.29. By capturing more of the targeted material for recycling, it reduces the number of containers that could potentially enter the litter stream. This would reduce the direct costs to landowners of collecting this material and the scale of a number of indirect impacts of litter.

3.30. Influencing product design is also possible within the scheme design, particularly in regard to ensuring a more consistent specification of material – as this maximises the quality of recycled material for resale. There is also scope to utilise variable fees within the scheme to motivate other design choices.

3.31. A successful DRS will achieve an extremely high capture rate of target materials. The true national recycling rate for the materials targeted via a DRS will actually be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

3.32. To achieve a high capture rate, requires interaction with almost the entire population on a regular basis via return points where the public take back containers to redeem the deposit. These locations provide valuable advertising space, which could be utilised to communicate other messages related to the circular economy, for example sign posting local authority services for the recycling of other materials not included in the DRS

Principle 4 – Delivering maximum economic and societal benefit for Scotland during the transition to a low carbon world

3.33. As well as broader impacts on material use and disposal, the scheme also has the potential to have wider economic, social and environmental impacts. The proposed criteria for evaluating these are:

- Demonstrate a net overall positive economic impact (including but not exclusively contributing to a low carbon economy, develop new reprocessing opportunities and generating additional jobs or securing existing jobs).
- Ensure a fairness for all demographic groups e.g. considering the impacts of the deposit level on households on lower incomes.
- Maximise accessibility to all demographic groups e.g. ensure there is no need to access a private vehicle to redeem deposits.
- Deliver exemplar "circular" business practices while still delivering value for money e.g. leasing models for reverse vending machines.
- Create employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities.
- Create opportunities to raise funds for charitable causes, where use of the money can have wider societal benefits.
- Optimise the positive impacts for SME businesses including small retailers.

3.5 Existing situation

Current recycling rate:

3.34. Scotland's household recycling rate has increased substantially in the last decade. The latest figures, published in September 2017[42] by the Scottish Environment Protection Agency (SEPA), confirm that in 2016 the household recycling rate reached 45.2%.

3.35. This has been driven by substantial investment by central and local government in kerbside collections. The result has been a dramatic increase in the

[42] SEPA 2016 Household Waste Data

number of households who have access to recycling facilities. All 32 Local Authorities are now nearing completion of these rollouts, covering most of the properties in their area.

3.36. The rate of growth, has however, been slowing. Since 2014, and the introduction of a new methodology for calculating recycling rates, it has only increased by 2.4%. A complex range of factors contribute to this limited improvement and it is clear that further intervention is required to stimulate growth in recycling rates, in order to achieve national recycling targets for 2025 and beyond.

3.37. Current trends indicate that household recycling rates in Scotland are not rising quickly enough and that further intervention is required to achieve the ambitious targets established by the Scottish Government. Most types of material used in drinks containers are easily recyclable and there is scope to improve their recycling rates.

3.38. Recycling quality also remains challenging, with financial and operational constraints limiting the level of segregation that can be achieved. Scotland's Household Recycling Charter[43] will result in an improvement but these high value materials will continue to be degraded due to the limited ability to separate them from other items of household waste collected at the kerbside.

3.39. The economic opportunity presented by collecting this material in a way that maximises its value and having it managed by a single actor highlights the need for intervention. Currently the quality of the material is not maximised and it remains spread across many organisations including Local Authorities and private waste management companies, limiting the opportunity to provide strategic leverage for the development of new business opportunities. As an aggregated and high-quality resource, the material contained in used drinks containers can be used to secure a greater proportion of the value in Scotland's economy either as a feedstock to other industries, attracting reprocessing capacity, or attracting a higher price when selling onto the international market.

3.40. The introduction of a DRS will present an opportunity to influence public behaviour and engage people on the principles of a circular economy. It will impact on almost every individual in Scotland, however, by placing a value on "waste materials" which can help to change perceptions and embed positive habits.

3.41. In considering the impact of a DRS on national recycling rates for the target materials, it is important to note that the true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams.

[43] Charter for Household Recycling

3.6 Needs (current & future)

Recycling rate of target materials:

3.42. As well as the above observations on the household recycling rate, the recycling rates for those materials potentially within scope of a deposit return scheme demonstrate that there is scope for improvement.

3.43. Focusing on drinks containers, there are limitations in the available Scottish specific data in relation to sales, waste by material type and material reprocessing. Zero Waste Scotland estimate the following recycling rates for local authority collections as shown in Table 2.

Table 2 Current Local Authority Household Collection of Target Containers

Material	% recycled
Glass drinks containers	59%
Steel drinks containers	46%
Aluminium drinks containers	49%
Plastic (PET) drinks containers	53%
Plastic (HDPE) drinks containers	53%
Cartons	39%
Disposable cups	0%

*Disposable cups did not exist as a separate category in the compositional analysis.

3.44. Plastic bottles, glass bottles, metal cans and beverage cartons are widely targeted for recycling, either via kerbside collections or recycling points and centres. Despite this there is clearly scope for improving recycling rates, with the best performing deposit return schemes in the world achieving a capture rate of up to 95%.

3.45. Single use cups are an area which has attracted high profile coverage in the media, especially “coffee cup” style containers consisting of a paper cup with a plastic and/or metal foil lining. These are most frequently used in quick service restaurants, coffee shops and food takeaway shops and so are consumed on the go. These types of cups can potentially be recycled with collections for beverage cartons. This does not refer to disposable cups without a paper content.

3.46. It is worth noting here that a deposit return scheme operates to collect “single use” drinks containers and not “refillable” containers. Across many countries in Europe organised schemes for “refillable” glass bottles are also in operation. These schemes are logistically and commercially separate from Deposit Return Schemes

but where both types of scheme are present in the same nation (e.g. in Finland) they often work alongside each other.

3.47. Refillable schemes utilise a standard glass bottle design and industry participants also agree standard collection crate designs, shared logistics and infrastructure arrangements (such as bottle washing and refilling facilities) amongst themselves. Such schemes usually include brewers and soft drink companies covering a specific range of products. There may be scope for such a scheme to be developed in Scotland in the future, in addition to a Deposit Return Scheme. The potential for such would be dependent on a suitable collaboration of industry participants and the availability of the right infrastructure, however a Refillables Scheme is out of scope for this programme.

Quality of End-Materials:

3.48. As well as assessing the amount of targeted material collected, it is also important to consider the end destination for those materials. A true "circular economy" approach is one where the quality of material collected is high enough, that it can displace virgin materials (e.g. plastics made from oil, or aluminium made from bauxite) in high value uses.

3.49. As noted above, detailed data specifically on Scottish waste materials often does not exist. The majority of these materials are however currently collected co-mingled i.e. mixed together with other household packaging. For glass, even where it isn't co-mingled, the collection method makes it difficult to separate different colours as a mechanical sort is required.

3.50. The Recycling Quality Reporting Tool[44] using data from the Materials Recovery Facility (MRF) Code of Practice shows between 7% and 13% non-target and non-recyclable (material that should not be present) materials in metals, plastics and glass, leaving MRFs for reprocessing. So, while a majority of a material is being collected, the overall amount suitable for high value recycling could be very different. This is a result of contamination from other comingled materials, and/or the cost of separating materials to achieve a high value being uneconomic.

Litter:

3.51. The costs of litter, both direct and indirect, are identified earlier in this report. Zero Waste Scotland, in its report "Scotland's Litter Problem"[45], has identified the average composition of the litter stream in Scotland.

3.52. The categorisation doesn't differentiate between drinks containers and other containers but the following breakdown, by weight, was identified: plastic bottles (9%), glass bottles (9%) and metal cans (4%). It is not possible to identify beverage cartons, pouches or single use cups within the categories used.

[44] Recycling Quality Reporting Tool
[45] Scotland's Litter Problem

3.53. When assessing the contribution to indirect costs, such as visual disamenity, then volume, rather than weight, is a more accurate indicator of impact. Measured by volume, drinks containers would make up a greater proportion of the litter stream than indicated above.

3.54. The Marine Conservation Society's Great British Beach Clean 2017[46], provides a breakdown of the sources of litter and types of materials found. Over 30% of material is littered by the public and 46% remains unsourced, primarily because it has broken down into fragments too small to identify. Glass and container caps & lids both appear in the top 10 items found in these surveys.

Economic Opportunities:

3.55. Both Scotland's Economic Strategy[47] and Manufacturing Action Plan[48], recognise the economic opportunities presented by "Making Things Last". Creating the conditions for a more circular economy helps companies embrace new business models and manufacturing processes and transforms used products into assets. In addition to ensuring that the lifecycle of all resources is maximised, this approach also helps to protect against increased volatility and vulnerability in the supply of raw materials.

3.56. A Deposit Return Scheme provides opportunities as an exemplar of circular business practices, maximising the financial value of secondary resources to Scotland and creating a potential high value feedstock for industry in Scotland.

3.7 Scope and service requirements

3.57. This Strategic Outline Case (SOC) proposed a shortlist of scheme design options that were viewed to deliver the best outcomes against each of the stated principles.

3.58. The SOC excluded some options from the long list that were not capable of delivering the required outcomes for the principles, and presented the four examples to be taken forward in this OBC and evaluated in regard to their full costs and benefits:

- **Example 0** or Do-nothing: (No scheme is introduced) will be modelled for the purposes of developing a baseline, to assess the impacts of no intervention.
- **Example 1** Take back to dedicated drop-off points
- **Example 2** Take back to dedicated drop-off points and some shops (with cartons and cups)
- **Example 3** Take back to any place of purchase
- **Example 4** Take back to any place of purchase (with cartons and cups)

[46] MCS Great British Beach Clean
[47] Scotland's Economic Strategy, March 2015
[48] A Manufacturing Future for Scotland

3.59. The approach to assessing each of the scheme design options will be, wherever possible, to calculate an economic value (either cost or benefit) against each of the actors in scope of a DRS. This will allow a Net Present Value (NPV) to be calculated.

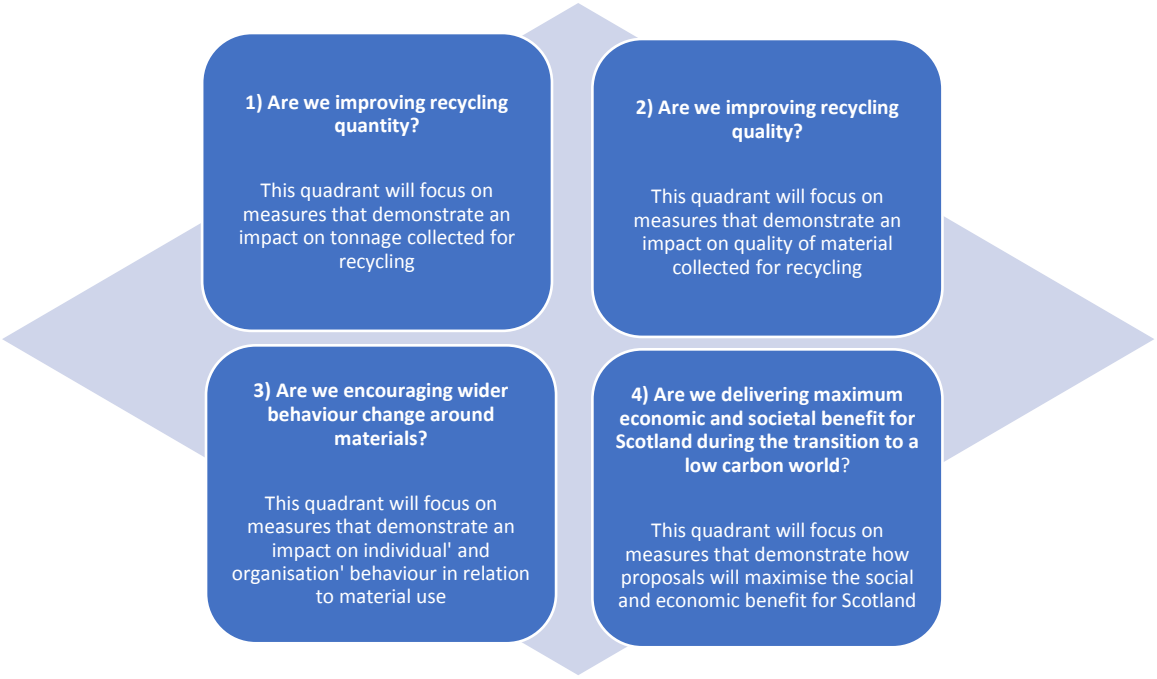
3.60. Where it is not possible to convert the impact directly into an economic value, then a weighting and scoring matrix has been developed. This is applied to four of the criteria identified and a weighted score for each criteria will complement the NPV for each design option.

3.8 Benefits criteria

3.61. Potential benefits arising from an intervention are significant and varied. They are also spread across many actors from businesses, academia, the public sector and societal benefits. Some of these are measurable and quantifiable while others are more difficult to assess, requiring a more qualitative approach.

3.62. The benefits criteria relate to the overall principles as illustrated in Figure 2.

Figure 2 Relationship between benefits criteria and overall principles



3.63. These criteria will ensure that the full environmental, economic and social impacts are captured. The completion of a Business Regulatory Impact Assessment will also help to establish where the benefits and costs are distributed.

3.64. Ensuring fairness and accessibility are key criteria for the Scottish Government and, in this context, links to the principle of climate justice. This is

defined as “ensuring collectively and individually we have the ability to prepare for, respond to and recover from climate change impacts – and the policies to mitigate or adapt to them – by considering existing vulnerabilities, resources and capabilities”[49].

3.65. Providing an exemplar business model for the adoption of circular economy thinking provides an opportunity to maximise the economic gains in Scotland, inspire other organisations with practical examples, and help create markets that otherwise wouldn’t exist.

3.66. The delivery of a DRS will generate a range of employment opportunities across management, operational and administrative roles. It is likely that a proportion of these will be entry level jobs, creating opportunities for those furthest from the labour market to learn new skills and gain experience. The creation of these opportunities will be one of the benefits that the programme will seek to measure.

3.67. The operation of a DRS will provide the opportunity for charitable donations to generate social and or environmental benefits. This could be through donations of containers or the deposit to existing charities or new channels and could enhance the net benefit to society.

3.9 Strategic risks (including mitigation and management)

3.68. Risks arising from some potential negative consequences of the intervention have been identified and are relevant to deciding on whether to proceed. Some of the high-level risks are outlined below.

3.69. Separation of these materials into a new dedicated collection operation will impact on existing contracts and collection arrangements for Local Authorities and private waste management companies. This may require renegotiation of any longer-term contracts and investment to realign and optimise collection operations.

3.70. The requirement to provide consumer information and mitigate fraud within any proposed scheme is likely to require some degree of Scottish specific labelling. This will represent a change for any business involved in the production and/or logistics of any relevant drinks containers, as currently labelling requirements are consistent across the UK. The creation of a Scottish Stock Keeping Unit, (effectively a unique product barcode) will have a combination of one-off and ongoing costs including printing, increased changeovers during production, increased stock management and impacts on logistic operations and flexibility.

3.71. The placing of a financial value on containers, that otherwise doesn’t exist, may attract criminals attempting to defraud the scheme. With billions of containers entering circulation, even a small deposit creates a large sum of money to target.

[49] Banks et al 2014, Climate change and social justice: an evidence review

The potential scale of fraud will also determine the cost of mitigation measures required; as demonstrated by arrangements in other countries operating DRS. Discussions with Police Scotland have taken place to discuss the implementation of a DRS and will continue to do so as a final scheme design is confirmed.

3.72. There is a risk that inadequate communication could result in poor performance of the DRS. The introduction of a new collection system will impact on stakeholders who are required to communicate the change to customers and the public. These stakeholders will need to explain how the new schemes and services operate and how they interact with existing collection infrastructure.

4. The socio-economic case

4.0. Each of the four Examples outlined in Section B provide the functions required to deliver the principles of the DRS. This socio-economic case appraises each example by calculating a NPV and a complementary qualitative multi-criteria analysis (MCA) score.

4.1. This part of the OBC modelling contains sensitive information that could negatively impact the value for money achievable through subsequent stages involved in implementing a DRS. For this reason, some financial information, particularly around the breakdown of costs, is not separately identified in this document.

4.2. Economic analysis is used to place a quantitative value on the overall delivery of a DRS for Scotland which can allow costs and benefits to be compared. However, some impacts are difficult to quantify and in these cases HM Treasury recognised MCA techniques are applied.

4.3. There are a number of impacts, where it has not been possible to calculate a cost or benefit value for inclusion in this OBC. These additional impacts are included following the analysis of the NPV. Each is provided with an indication of the likely scale of their impact, the confidence that a financial figure could be attributed for inclusion in the NPV for the FBC, and a ranking of the four examples against these.

4.4. Developing these examples is intended to provide an indication of the scale of costs and benefits from different types of schemes. This approach provides insight into the interaction of different design choices and how individual components relate to each other as part of an overall system.

4.5. Development of a final scheme design is at an early stage, with this OBC document accompanying a full public consultation. A preferred approach is not therefore proposed within the four examples and, indeed, it is possible that any final design will be a hybrid option or have an alternate selection on one or more of the components following on from the consultation.

4.6. Until a final system design is identified, and a decision made on whether to attempt to quantify a broader range of impacts within the NPV, these examples should not be interpreted as the potential costs and benefits for Scotland's DRS for individual actors. Instead this OBC provides an evidence base for making a choice between options that fulfil the principles of the Programme.

4.7. As well as the NPV and the ranking of additional impacts, an MCA has been used to assist the comparison of the examples. MCAs are often utilised when criteria which cannot be quantified need to be assessed.

4.1 Key assumptions

4.8. To provide an informed body of evidence to support the design of a DRS for Scotland, certain assumptions have been made in compiling the examples presented.

Population and waste growth

4.9. The model contains a projected population growth for Scotland. There is assumed to be a direct correlation between population growth and waste arisings i.e. no other assumptions have been made on either an increase or reduction in total tonnage projections.

Current recycling rates for target materials

4.10. Current recycling rates for containers in household waste, that could be within scope of a DRS, are based on compositional analyses conducted on Local Authority kerbside collections. The exception to this is single use cups, which did not exist as a separate category in these analyses. A recycling rate of 1% has been assumed for these to allow for some commercial collection, although no evidence of collection on any scale has been identified in Scotland.

4.11. For hospitality premises, expert opinion was provided by key stakeholders to estimate the current recycling rate. The weight of containers sold via these premises was then used to establish a tonnage for this collection stream. As this is using a "clean" on-market weight for this calculation (in contrast to the "dirty" weight measured in waste composition above), the amount of material is likely to be relatively underestimated.

Diversion of material to a DRS

4.12. The true national recycling rate for the materials targeted via a DRS will be slightly higher than the system capture rate itself. This is because some items not returned to DRS will continue to be returned to other recycling streams

4.13. The modelling we have undertaken in developing this Outline Business Case assumes that DRS materials are removed equally from the current recycling stream and current residual stream. The model treats all our scenarios equally in this respect but at lower performance rates, or for materials with higher baseline recycling rates, it may in practice be more likely that material disproportionately comes from existing recycling streams. If this is indeed the case, scenarios presented here may overstate the net recycling gain and associated carbon benefit for low performance scenarios, making the 70% and especially 60% scenarios look artificially closer to high performance scenarios when assessed on these two criteria.

Type of Deposit

4.14. All the examples use a single deposit level for all containers i.e. there isn't a different deposit by container size or product/material type. This reflects feedback from stakeholders that a single deposit would promote simplicity for the public, and information provided by systems abroad to the effect that a variable deposit sends mixed messages about the "value" of containers.

4.15. It is also assumed that the deposit is not subject to any taxation e.g. VAT. The result is the public get back the full amount of the deposit, when they return the container, and that the full amount of unredeemed deposits is available to the system operator.

Single Centralised System

4.16. Each of the examples is based on a single organisation acting as the system operator. This approach allows delivery of a scheme that covers the whole of Scotland, as remote rural locations aren't disadvantaged by incurring costs that would make delivery of the scheme uneconomical. It also provides the necessary control functions to minimise fraud and maximise other potential benefits e.g. ownership of large amounts of materials.

4.17. Due to the size of the Scottish market, this is considered the most likely outcome in scheme design. Utilising this organisational approach however does not prejudge how different functions would be delivered, as this still allows for in-house delivery, outsourcing to existing organisations or a mix of both.

System Financing

4.18. In addition to a single central system, certain assumptions have been made about how the system would be financed. There are three main revenue streams identified: sale of materials, unredeemed deposits and producer fees.

4.19. The "ring fencing" of the first two revenue streams assumes that these cannot be used for any other purpose and creates a base income. Any costs incurred above this are then recovered by charging a fee on producers. Where these revenue streams exceed the costs for the system then this is displayed as a surplus for the system operator i.e. no assumptions are made about how this would be spent.

Impact on balance sheet

4.20. For the purposes of calculating the Economic NPV, the impact of financing the establishment of a DRS is included as costs to the scheme in year zero. This ensures that these are considered when evaluating the impacts of any scheme.

4.21. In the financial appraisal, the scale of these costs is dependent on final system design, decisions made by the system operator and exploration of different financing options. As a result, identification of the actual financial flows incurred and approach to financing these costs will only be definitive once the system operator has been established.

4.2 Estimation of costs

4.22. This section looks at different examples for delivering a DRS in Scotland. The work was undertaken using a bespoke Excel model, developed by Zero Waste Scotland for this Programme.

4.23. The model was subject to peer review to provide assurance that it is logical, accurate and appropriate, and that the design, build and performance is consistent with the model's purpose of providing analytical substantiation of the best approach in the construction of an effective Deposit Return Scheme for Scotland.

4.24. This model builds a baseline of waste arisings for potentially targeted materials and projects this using population growth from 2014-2042. Current waste management practices are then utilised to calculate a performance and cost profile for business as usual. The details of the European Commission's Circular Economy Package in relation to future targets and therefore compliance costs have been incorporated into the model.

4.25. Separate input tables allow scheme design and performance variables to be constructed. This includes capture rates for the DRS, level of deposit, number and configuration of return points, infrastructure and staffing costs.

4.26. Input tables also capture external assumptions and costs and benefits that are external to system design parameters. This includes current and projected disposal costs, haulage costs, costs to industry and environmental benefits such as avoided litter and carbon emissions.

4.27. Many of these input parameters are logically linked (e.g. deposit level and return rate) in a coherent scenario, taking into account all elements of proposed system design. The model does not compute these linkages automatically and so they are entered into the model as input variables.

4.28. The model then calculates a 25-year NPV, using all of the above information to calculate the variation from "do nothing", dependent on the example scheme design parameters selected.

4.29. This section goes on to describe five scenarios, one where no deposit scheme is introduced and four example schemes. The four DRS examples explored reflect the belief that both deposit level and system convenience drive performance. This requires a qualitative judgement, but reflects overseas performance, where the relationship between deposit level and capture is not direct.

4.30. Under each example, information is provided to describe the main elements of the system and a breakdown of costs by different actors. The wider costs and benefits to society are then described. This is all summarised in a 25-year NPV, to facilitate an accurate comparison between the different example scheme designs.

4.31. The model has been designed to accommodate some input values which are not currently available due to lack of data. Following the quantified information in the model for all of the examples, additional costs and benefits are articulated in a narrative. These apply to all example schemes and the data could potentially, be quantified within the NPV for the purposes of the FBC. For each factor described, this narrative identifies the scale of the potential impact, the likelihood that this could be quantified for the FBC, and provides a ranking of the four current examples against this. We also discuss sensitivities in the model, focusing on those that may make a material difference in deciding between preferred scenarios.

Estimated Costs of Example 0: No Deposit Return Scheme is introduced

4.32. For the purposes of calculating the NPV of the different DRS examples, the baseline (Example 0) is presented as zero. The costs and benefits in Examples 1-4 are then incremental costs and benefits from this fixed point.

Estimated Costs of Example 1: Take Back to dedicated drop-off points

4.33. This example assumes that glass bottles, metal cans and PET plastic bottles are the materials in scope, with materials returned to dedicated drop-off points. Example 1 has a deposit level of 20p and 1,058 return locations established across the country, achieving a capture rate of 60%.

4.34. The 60% capture rate is assumed to apply equally to both existing residual and recyclate streams, across all sectors. In calculating overall recycling and carbon benefits, remaining recyclate is then also factored in. This may significantly overstate the additionality of this scenario against these criteria, if in fact a greater proportion of DRS capture is diverted from existing recyclate streams, and less from residual.

4.35. Based on the assumptions presented in the previous section, the costs and benefits have been calculated for this example DRS. In order to present the costs for this example in a comparable format with the other examples, a 25-year NPV has been calculated. Applying a discount rate of 3.5% in line with HM Treasury Green Book methodology this example generates the following benefits and costs:

	EXAMPLE 1: NPV (£)		
Actor	Costs	Benefits	Net benefit
System Operator	-£1,114 million	£2,354 million	£1,240 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,150 million	£0	-£2,150 million
Producers	-£132 million	£800 million	£668 million
Local Authorities	£0	£110 million	£110 million
Commercial Premises	£0	£23 million	£23 million
Other Sectors	-£85 million	£85 million	£0 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£768 million	£768 million

TOTAL	-£3,646 million	£4,140million	£494 million

4.36. Example 1 has a total net benefit of £494 million over the 25-year NPV.

4.37. The System Operator is the National Scheme Administrator of the DRS established by industry on a not for profit basis. The costs (£1,114 million) to the System Operator arise from operating return locations, a central bulking facility, logistics, the cost of fraud, communications and staff employed directly by the scheme. Benefits to the System Operator (£2,354 million) arise from unredeemed deposits and material sales. As income is greater than costs incurred, the System Operator has a net benefit of £1,240 million over the NPV 25-year period under Example 1. The NPV has made no assumptions on how this surplus would be spent.

4.38. The unredeemed deposits of £2,150 million over a 25-year period are a result of the consumer choosing not to return their deposit bearing container for exchange of their refundable deposit.

4.39. Return points refers to those facilities that are operated by a separate organisation. The cost of return points under Example 1 is therefore £0 million over the 25-year period as the dedicated drop-off points are all operated by the System Operator and as such all costs associated in operation and upkeep of such locations are internalised by the System Operator.

4.40. Under a DRS, producers are those companies that put deposit bearing products onto the market. DRS is a form of product stewardship, where producers who benefit from placing material onto the market incur the costs of ensuring appropriate treatment at end of life. As such producers are responsibly for contributing to the scheme. In this example the cost of producer's contribution to this scheme would be £0 million. This is a result of the revenue from unredeemed deposits and sales of material exceeding the running cost for the system.

4.41. Under Example 1 producers are expected to incur costs (£132 million) from upfront capital costs and costs associated with changes to labelling. Producers will benefit (£800 million) by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy package and through reimbursement of these upfront costs. The net benefit to producers under Example 1 is expected to be £668 million.

4.42. There are also benefits in sectors not directly involved in the operation of a DRS. These benefits are accrued by Local Authorities and commercial premises who are currently paying for disposal of material that would be collected by the DRS. This is £110 million and £23 million respectively. Under the NPV other sectors are private Waste Management companies and RVM servicing. The net benefit is a result of a small profit, not turnover, within these sectors.

4.43. The value of the of public contribution to participate in the scheme has been estimated as £165 million over the NPV 25-year period.

4.44. This estimate is identical across for all four examples as there is insufficient data to model this contribution in a more example specific manner. Previous exploration of value for take back to any place of purchase examples suggests this contribution could be valued higher for higher return rates, as more people participate; however, this relationship is unlikely to hold for dedicated drop-off point examples where increased inconvenience for participants is likely to more than offset this effect. Indeed, it could be considered that this may not fully capture the costs for Example 1 given the lower level of return points and therefore greater journey times for consumers to return their containers in comparison to the other examples.

4.45. Benefit to society from the introduction of a DRS is valued at £768 million over the 25-year period. The majority of this is the reduced to local neighbourhoods from targeting a highly visible component of the litter stream and the value of avoided carbon emissions.

Estimated Costs of Example 2: Take back to dedicated drop-off points and some shops (with cartons and cups)

4.46. This example assumes a broad range of materials are in scope; glass bottles, metal cans, plastic bottles, beverage cartons and paper based take-away cups, with materials returned to dedicated drop-off points and some shops. With a deposit level of 20p and 2,009 dedicated drop-off points established, within a proximity of points where drinks containers are purchased, a capture rate of 70% is modelled.

4.47. The 70% capture rate is assumed to apply equally to both existing residual and recyclate streams, across all sectors. In calculating overall recycling and carbon benefits, remaining recyclate is then also factored in. This may significantly overstate the additionality of this scenario against these criteria, if in fact a greater proportion of DRS capture is diverted from existing recyclate streams.

4.48. Based on the assumptions presented in the previous section, the costs and benefits have been calculated for this example DRS. In order to present the costs for this example in a comparable format with the other examples, a 25-year NPV has been calculated. Applying a discount rate of 3.5% in line with HM Treasury Green Book methodology this example generates the following benefits and costs:

	EXAMPLE 2: NPV (£)		
Actor	Costs	Benefits	Net benefit
System Operator	-£2,086 million	£3,013 million	£927 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,558 million	£0	-£2,558 million
Producers	-£370 million	£1,214 million	£844 million
Local Authorities	£0	£146 million	£146 million
Commercial Premises	£0	£37 million	£37 million
Other Sectors	-£153 million	£155 million	£2 million

Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£1,119 million	£1,119 million
TOTAL	-£5,332 million	£5,684 million	£352 million

4.49. Example 2 has a total net benefit of £352 million over the 25-year NPV.

4.50. The System Operator is the National Scheme Administrator of the DRS established by Industry on a Not for Profit basis. The costs (£2,086 million) to the system operator arise from operating return locations, a central bulking facility, logistics, the cost of fraud, communications and staff employed directly by the scheme, while benefits to the system operator (£3,013 million) arise from unredeemed deposits and material sales. As income is greater than costs incurred, the System Operator has a net benefit of £927 million over the NPV 25-year period under Example 2. The NPV has made no assumptions on how this surplus would be spent.

4.51. The unredeemed deposits of £2,558 million over a 25-year period are a result of the consumer choosing not to return their deposit bearing container for exchange of their refundable deposit.

4.52. Drop-off points refers to those facilities that are operated by a separate organisation. The cost of return points under Example 2 is therefore £0 million over the 25-year period as the dedicated take back points are all operated by the System Operator and as such all costs associated in operation and upkeep of such locations are internalised by the System Operator.

4.53. Under a DRS, producers are those companies that put deposit bearing products onto the market. DRS is a form of product stewardship, where producers who benefit from placing material onto the market incur the costs of ensuring appropriate treatment at end of life. As such producers are responsibly for contributing to the scheme. In this example the cost of producer's contribution to this scheme would be £0 million. This is a result of the revenue from unredeemed deposits and sales of material exceeding the running cost for the system.

4.54. Under Example 2 producers are expected to incur costs (£370 million) from upfront capital costs and costs associated with changes to labelling. Producers will benefit (£1,214 million) by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy package and through reimbursement of these upfront costs. The net benefit to producers under Example 2 is expected to be £844 million.

4.55. There are also benefits in sectors not directly involved in the operation of a DRS. These benefits are accrued by Local Authorities and commercial premises who are currently paying for disposal of material that would be collected by the DRS. This is £146 million and £37 million respectively. Under the NPV other sectors are private

Waste Management companies and RVM servicing. The net benefit is a result of a small profit, not turnover, within the RVM servicing sector.

4.56. The value of the public contribution to participate in the scheme and this has been estimated as £165 million over the NPV 25-year period.

4.57. This estimate is identical across for all four examples as there is insufficient data to model this contribution in a more example specific manner. Previous exploration of value for return to any place examples suggests this contribution could be valued higher for higher return rates, as more people participate; however, this relationship is unlikely to hold for return to dedicated drop-off point examples where increased inconvenience for participants is likely to more than offset this effect. Indeed, it could be considered that this may not fully capture the costs for Example 2 given the lower level of return points, in comparison to Examples 3 and 4, and therefore increased overall journey times for consumers to return their containers. The increased return rate versus Example 1 offsets the additional distance required in Example 1 to return containers.

4.58. Benefit to society from the introduction of a DRS is valued at £1,119 million over the 25-year period. The majority of this is the reduced disamenity to local neighbourhoods from targeting a highly visible component of the litter stream and the value of avoided carbon emissions.

Estimated Costs of Example 3: Take back to any place of purchase

4.59. This example assumes a broad range of materials are in scope; glass bottles, metal cans and PET plastic bottles, with materials returned to any place of purchase. With a deposit level of 10p and 17,407 return locations located at any premise that sells these containers, a capture rate of 80% is achieved.

4.60. The 80% capture rate is assumed to apply equally to both existing residual and recyclate streams, across all sectors. In calculating overall recycling and carbon benefits, remaining recyclate is then also factored in. This may slightly overstate the additionality of this scenario against these criteria, if in fact a greater proportion of DRS capture is diverted from existing recyclate streams, and less from residual.

4.61. Based on the assumptions presented in the previous section, the costs and benefits have been calculated for this example DRS. In order to present the costs for this example in a comparable format with the other examples, a 25-year NPV has been calculated. Applying a discount rate of 3.5% in line with HM Treasury Green Book methodology this example generates the following benefits and costs:

	EXAMPLE 3: NPV (£)		
Actor	Costs	Benefits	Net benefit
System Operator	-£1,304 million	£1,304 million	£0
Return Points	-£859 million	£859 million	£0
Unredeemed Deposits	-£545 million	£0	-£545 million

Producers	-£654 million	£890 million	£236 million
Local Authorities	£0	£149 million	£149 million
Commercial Premises	£0	£31 million	£31 million
Other Sectors	-£137 million	£138 million	£1 million
Value of Public Contribution	-£165 million	£0	-£165 million
Society Benefits		£1,038 million	£1,038 million
TOTAL	-£3,664 million	£4,409 million	£745 million

4.62. Example 3 has a total net benefit of £745 over the 25-year NPV.

4.63. The System Operator is the National Scheme Administrator of the DRS established by Industry on a Not for Profit basis. The costs (£1,304 million) to the system operator arise from operating return locations, a central bulking facility, logistics, the cost of fraud, communications and staff employed directly by the scheme, while benefits to the system operator (£1,304 million) arise from unredeemed deposits and material sales. As income and costs incurred are equal, the System Operator has no net benefit over the NPV 25-year period under Example 3.

4.64. The unredeemed deposits of £545 million over a 25-year period are a result of the consumer choosing not to return their deposit bearing container for exchange of their refundable deposit.

4.65. Drop-off points refers to those facilities that are operated by a separate organisation. The cost of all 17,407 return points under Example 3 is £859 million over the 25-year period. This cost is incurred from staff time, the value of any lost retail space, miscellaneous supplies, and where an automated solution is used, the cost of maintaining and operating the RVM. The NPV calculates a benefit of £859 million for return points as return locations will be fully reimbursed, leading to no overall net benefit or loss over the 25-year NPV period.

4.66. Under a DRS, producers are those companies that put deposit bearing products onto the market. DRS is a form of product stewardship, where producers who benefit from placing material onto the market incur the costs of ensuring appropriate treatment at end of life. As such producers are responsible for contributing to the scheme. This is a result of the operating costs of the scheme exceeding the from revenue from unredeemed deposits and sales of material exceeding. Producers would be required to contribute to cover this shortfall in revenue required to cover system operating costs and return point operating costs.

4.67. Under Example 3 producers are anticipated to incur costs (£654 million) from contributing to operating costs, upfront capital costs and costs associated with changes to labelling. Producers will however benefit (£890 million) by avoiding future compliance costs associated with the implementation of the European Commission's

Circular Economy package and through reimbursement of these upfront costs. The net benefit to producers under Example 3 is therefore £236 million.

4.68. There are also benefits in sectors not directly involved in the operation of a DRS. These benefits are accrued by Local Authorities and commercial premises who are currently paying for disposal of material that would be collected by the DRS. This is £149 million and £31 million respectively. Under the NPV other sectors are private Waste Management companies and RVM servicing. The net benefit is a result of a small profit, not turnover, within the RVM servicing sector.

4.69. The value of the public contribution to participate in the scheme and this has been estimated as £165 million over the NPV 25-year period.

4.70. This estimate is identical across for all four examples as there is insufficient data to model this contribution in a more example specific manner. There is an increased number of containers being returned in this example, versus Examples 1 and 2, however the increased convenience of those locations and therefore reduced overall distance travelled will at least offset this difference.

4.71. Benefit to society from the introduction of a DRS is valued at almost £1,038 million over the 25-year period. The majority of this is the reduced disamenity to local neighbourhoods from targeting a highly visible component of the litter stream and the value of avoided carbon emissions.

Estimated Costs of Example 4: Take back to any place of purchase (with cartons and cups)

4.72. This example assumes a broad range of materials are in scope; glass bottles, metal cans, plastic bottles, beverage cartons and paper based take-away cups, with materials returned to any place of purchase. With a deposit level of 10p and return locations located at any premise that sells these containers, achieving a capture rate of 80%.

4.73. The 80% capture rate is assumed to apply equally to both existing residual and recyclate streams, across all sectors. In calculating overall recycling and carbon benefits, remaining recyclate is then also factored in. This may slightly overstate the additionality of this scenario against these criteria, if in fact a greater proportion of DRS capture is diverted from existing recyclate streams, and less from residual.

4.74. Based on the assumptions presented in the previous section, the costs and benefits have been calculated for this example DRS. In order to present the costs for this example in a comparable format with the other examples, a 25-year NPV has been calculated. Applying a discount rate of 3.5% in line with HM Treasury Green Book methodology this example generates the following benefits and costs:

	EXAMPLE 4: NPV (£)		
Actor	Costs	Benefits	Net benefit
System Operator	-£1,409 million	£1,409 million	£0

Return Points	-£874 million	£874 million	£0
Unredeemed Deposits	-£860 million	£0	-£860 million
Producers	-£446 million	£965 million	£519 million
Local Authorities	£0	£168 million	£168 million
Commercial Premises	£0	£42 million	£42 million
Other Sectors	-£148 million	£149 million	£1 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£1,285 million	£1,285 million
TOTAL	-£3,902 million	£4,892 million	£990 million

4.75. Example 4 has a total net benefit of £990m over the 25-year NPV.

4.76. The System Operator is the National Scheme Administrator of the DRS established by Industry on a Not for Profit basis. The costs (£1,409 million) to the system operator arise from operating return locations, a central bulking facility, logistics, the cost of fraud, communications and staff employed directly by the scheme, while benefits to the system operator (£1,409 million) arise from unredeemed deposits and material sales. As income and costs incurred are equal, the System Operator has no net benefit over the NPV 25-year period under Example 4.

4.77. The unredeemed deposits of £860 million over a 25-year period are a result of the consumer choosing not to return their deposit bearing container for exchange of their refundable deposit.

4.78. Return points refers to those facilities that are operated by a separate organisation. The cost of all 17,407 return points under Example 4 is £874 million over the 25-year period. This cost is incurred from staff time, the value of any lost retail space, miscellaneous supplies, and where an automated solution is used, the cost of maintaining and operating the RVM. The NPV calculates a benefit of £874 million for return points as return locations will be fully reimbursed, leading to no overall net benefit or loss over the 25-year NPV period.

4.79. Under a DRS, producers are those companies that put deposit bearing products onto the market. DRS is a form of product stewardship, where producers who benefit from placing material onto the market incur the costs of ensuring appropriate treatment at end of life. As such producers are responsibly for contributing to the scheme. This is a result of the operating costs of the scheme exceeding that from revenue from unredeemed deposits and sales of material exceeding. Producers will be required to contribute to cover this shortfall in revenue required to cover system operating costs and return point operating costs.

4.80. Under Example 4 producers are expected to incur costs (£446 million) from contributing to operating costs, upfront capital costs and costs associated with

changes to labelling. Producers will however benefit (£965 million) by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy package and through reimbursement of these upfront costs. The net benefit to producers under Example 4 is therefore £519 million.

4.81. There are also benefits in sectors not directly involved in the operation of a DRS. These benefits are accrued by Local Authorities and commercial premises who are currently paying for disposal of material that would be collected by the DRS. This is £168 million and £42 million respectively. Under the NPV other sectors are private Waste Management companies and RVM servicing. The small net benefit is a result of profit, not turnover, within the RVM servicing sector.

4.82. The value of the public contribution to participate in the scheme and this has been estimated as £165 million over the NPV 25-year period.

4.83. This estimate is identical across for all four examples as there is insufficient data to model this contribution in a more example specific manner. Previous exploration of value for return to any place examples suggests this contribution could be valued higher for higher return rates, as more people participate; however, this relationship is unlikely to hold for return to dedicated drop-off point examples where increased inconvenience for participants is likely to more than offset this effect. There is an increased number of containers being returned in this example, versus Examples 1 and 2, however the increased convenience of those locations and therefore reduced overall distance travelled will at least offset this difference.

4.84. Benefit to society from the introduction of a DRS is valued at almost £1,285 million over the 25-year period. The majority of this is the reduced disamenity to local neighbourhoods from targeting a highly visible component of the litter stream and the value of avoided carbon emissions.

4.3 Additional impacts which it has not been possible to quantify

4.85. In addition to the costs and benefits described in calculating the NPV of the four examples, a number of wider impacts have also been identified.

4.86. It has not been possible to place a quantitative value on these for the purposes of developing this OBC. For some it may be possible to address this for the development of the FBC.

4.87. For many however it is not viable to calculate the value of the impacts, due to no robust methodology existing for valuing these benefits and/or the scale of the impacts being dependent on decisions made when establishing or operating the scheme. Unlike the criteria used in the qualitative Multi Criteria Analysis, these factors do not lend themselves to a focus group assessment.

4.88. To promote transparency, these costs and benefits have been separated from the NPV and this section will provide a narrative on how a DRS could influence these. For each factor it will provide an indication of the scale of the impact (Significant, Moderate or Minor), the likelihood of incorporating these into the NPV value (Probable, Possible or Unlikely) for the FBC and where a difference exists between the four example schemes, ranking (ranked 1-4 with 1 providing the strongest contribution to the achieving the factor) them based on their strength of contributing to these factors in a positive way.

4.3.1 Benefits from material quality and reprocessing

Factor 1: Improved Material Quality

4.89. One of the most significant improvements from a DRS is in the quality of materials generated for recycling. The collection method almost eliminates the potential for contamination and focusing on drinks containers results in a consistent material stream, as a limited number of materials are used for this purpose.

4.90. In calculating material revenues for the system, the current market price in the UK has been used. In amalgamating the tonnage under a single body and creating an exceptionally high-quality material stream, this is likely to be an underestimate. The Resource Association[50] has estimated that the cost of poor quality recyclate (5.9% contamination') at £15.67 per tonne. The Scottish MRF Code of Practice has identified 7%-13%[51] non-target and non-recyclable ('contamination') materials in metals, plastics and glass, leaving MRFs for reprocessing.

4.91. Additionally, in a global economy with a growing middle class there is a need to improve security of supply to materials. The improvement in material quality allows this to marketed as a feedstock for industry instead of a waste material i.e. it becomes a commodity rather than a disposal problem.

4.92. This issue has been evident recently, with the Chinese ban on waste materials being imported. The consequence of this is a need to significantly improve the quality of the materials that is presented for recycling regardless of its final destination.

4.93. Delivery of high quality materials will provide a resilience that has not been valued, as the market will continue to demand these inputs when being selective about sources of feedstock into manufacturing.

4.94. All Examples would deliver this impact, as the business model of a centrally operated DRS is focused on maximising material quality. This provides a key revenue stream and helps to offset other actors' contributions. Example 4 would see the highest amount of all material streams recycled. Example 3 would recycle a high

[50] Costs of Contamination, Resource Association, 2012
[51] Recyclate Quality Reporting Tool

amount of a more limited material stream. Example 2 recycles more materials than Example 3 however the impact per material type is more limited given the reduced capture of the scheme. Example 1 recycles the least amount of material and has therefore a more limited impact.

Scale of Impact: Significant
Integrate into NPV: Possible

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Material Quality	4	2	3	1

Factor 2: Attracting and securing processing capacity to Scotland

4.95. The wider economic benefits of material quality and amalgamating material under a single ownership have been discussed above. This benefit could be further magnified by attracting or securing manufacturing within Scotland to make use of the supply side improvement that this new high quality stream of recyclate represents.

4.96. This creates the potential for additional economic growth, by generating a "pull" for investment that would otherwise not exist without a DRS. In particular, Scotland already has a mature glass reprocessing industry that would be supported by generating a high quality local feedstock. There is also potential for new investment in plastics reprocessing, with other similar sized national DRS (like Sweden) attracting PET reprocessing.

4.97. This type of inward investment or innovation by existing Scottish companies would create new jobs, investment and additional economic growth that has not been calculated as part of the NPV. All current costs use existing infrastructure as end destinations, including haulage to these. Realising this inward investment or innovation by existing Scottish companies is dependent on realising a variety of factors such as achieving the necessary quality and the decisions made by the system operator.

4.98. Again this would be dependent on decisions made by the system operator. Example 4 is scored the highest here due to the ongoing involvement of the public sector, being able to help drive these outcomes. The other examples are all scored equally.

Scale of Impact: Significant
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Attracting processing capacity to Scotland or innovation by existing Scottish companies	2	2	2	1

Factor 3: Influencing Packaging Design

4.99. The introduction of a DRS also has the potential to introduce further material benefits by influencing packaging design. This would involve the system operator varying producer fees based on rewarding positive design choices.

4.100. An example of this can be seen in the Norwegian DRS, where producers are provided with a specification of materials that will not compromise the quality of the material being sold by the scheme e.g. avoiding heavy metal in any printing inks.

4.101. This mechanism could also be used to recognise light weighting of packaging or use of recycled content. This would help to influence these positive choices while being completely transparent to the consumer i.e. it wouldn't add any complexity for the public.

4.102. Supporting both of these changes would have environmental benefits, displacing or reducing the use of virgin materials. These have not been included in the current NPV calculation, as this is dependent on scheme operation and design choices. It is also not possible to forecast the impact of any such variable fees on influencing these design choices.

4.103. Example 4 is considered to have the greatest potential, as public sector involvement offers the opportunity to ensure that this approach is adopted and it covers the widest range of packaging. Example 2 has the same range of material and so would be next. Finally, Examples 1 and 3 are equal, in covering a more limited range of packaging and having the same ownership model.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Influencing Packaging Design	3	2	3	1

4.3.2 Wider litter benefits

Factor 4: Wider Litter Impacts

4.104. The calculation of the NPV has a benefit for litter prevention (ranging from £43m to £72m), calculating a quantitative value of avoiding the indirect costs associated with "waste in the wrong place". This figure is extrapolated to Scotland from a University of Leeds study[52], with a proportion of this value assigned to reduction in littered items expected from the different DRS scenarios.

4.105. This figure may not therefore be fully representative of the value of litter reduction in a broader range of locations e.g. avoiding marine litter, the wider Scottish countryside, tourist locations and areas where people visit regularly.

[52] Mark W*ardman, Abigail Bristow, Jeremy Shires, Phani Chintakayala and John Nellthorp (2013) Estimating the Value of a Range of Local Environmental Impacts, Report for Dept. for Environment, Food and Rural Affairs, 1 April 2011*

4.106. Example 4 has the largest benefit in this regard, as having the broader range of materials and highest capture rate. This is followed by Example 2, having the same range of materials but a lower capture rate. Example 3, with a high capture rate but limited range of materials, and then Example 1, which has the same range of materials as Example 3 but a lower capture rate.

Scale of Impact: Significant
Integrate into NPV: Probable

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Wider Litter Impacts	4	2	3	1

Factor 5: Reduction in Propensity to Litter

4.107. Similar to the argument around improved recycling of non-target materials, New South Wales (Australia) when introducing their DRS highlighted the impact on "propensity to litter"[53].

4.108. This highlighted a similar impact on littering behaviour, by both conscious and subliminal messaging. If people have other materials, at the same time as carrying a deposit bearing container, then they are less likely to litter these materials and continue carrying the container until they reach a return point. Also, the reduction in litter and the positive reinforcement of seeing their peers "doing the right thing" is likely to make littering even less socially acceptable.

4.109. The impact is that there is likely to be an even greater reduction in litter than is currently estimated. New South Wales have calculated the value of the benefits of litter including this greater decrease, as a result of not only drinks containers leaving the litter stream but also a proportion of other materials. This was the equivalent of an additional 9% decrease.

4.110. Examples 4 and 3 would have the greatest impact in this regard, with a higher capture rate creating more opportunities to shape behaviour. This is followed by Example 2 and then Example 1, again due to differences in capture rates.

Scale of Impact: Significant
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Reduction in Propensity to Litter	4	3	2	1

Factor 6: Magnified impacts of litter on certain socio-demographic groups

4.111. The impacts of litter are inconsistent across different socio-demographic groups. In particular, areas with multiple indices of deprivation are more likely to suffer the negative impacts of litter. This is also true for younger people, who are

[53] Australian Government (2014)

reported in the Scottish Household Survey[54] as more likely to notice the presence of litter.

4.112. Any reduction in litter is therefore likely to have a larger positive impact on these groups. The economic and social benefits delivered by positively impacting on areas of multiple deprivation could be argued to be greater than the benefits in more affluent areas. Therefore the 'true value' of any reduction in litter could be calculated as being higher.

4.113. The impact from this benefit is likely to be greatest where a larger proportion of material is captured and therefore less items are available to be littered. As a result, the ranking on this impact would be Example 4, Example 2, Example 3 and Example 1.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Magnified impacts of litter on certain socio-demographics	4	2	3	1

4.3.3 Industry costs

Factor 7: Impact on producer operational efficiencies

4.114. The NPV figure currently includes a one-off cost to industry of introducing a new Scottish specific stock keeping unit (SKU) i.e. a specific barcode and label for the Scottish market.

4.115. Businesses have however highlighted concerns about a number of ongoing costs of the introduction of separating goods placed onto the Scottish market from the rest of the UK. The three main costs identified were:

(i) Increased production losses from having to start and stop production more frequently
(ii) Increased storage requirements from having to store a contingency for two markets instead of one
(iii) Decreased logistical efficiency, as a result of a reduction in flexibility and not being able to redirect delivery vehicles due to carrying containers with different labels

4.116. Unfortunately, no estimates have been provided as to the scale of these ongoing costs and the duration that they are likely to be incurred. This is made difficult by the lack of data on what is currently distributed to Scotland, the spread across different distribution hubs in England and Scotland and how frequently logistics are redirected across the two countries.

[54] Scottish Household Survey

4.117. There are a number of markets that exist in Europe that have a dedicated label, are significantly smaller than Scotland and share borders with multiple countries. This would indicate that this would not be insurmountable. It is clear however that Examples 1 and 3, where a smaller range of products are in-scope of a DRS, would have less costs associated with this factor. Conversely, Examples 2 and 4, where cups and cartons are also included, would incur more costs. The scale of impact and ranking of this factor could change depending on discussions that are made following both the Scottish Government and DEFRA's consultations.

Scale of Impact: Moderate
Integrate into NPV: Possible

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Impact on Producer Efficiencies	1	2	1	2

Factor 8: Contribution to Sector Sustainability Strategies

4.118. All of the sectors, who represent the products that could be within scope of a DRS, have an environment or sustainability strategy. Almost all have some targets relating either directly to packaging or material use and carbon reduction.

4.119. The principle of increasing recycling quantity and quality for introducing a DRS, which are well evidenced from schemes operating elsewhere, will contribute to delivery of these strategies. This will include reducing carbon impact of packaging, ensuring a greater amount of packaging is collected for recycling and increasing the amount of recycled content in packaging.

4.120. This has a reputational benefit for those sectors and businesses involved, as consumers recognise their involvement and delivery on these issues which are becoming increasingly important as a differential in influencing purchasing.

4.121. Conversations with organisations who could be part of a DRS have already expressed an interest in both accessing the recycled material generated and also understanding the scale of the impact on capture rates.

4.122. Example 4 would be the most positive in this regard, incorporating the widest possible range of materials and with a high capture rate. Example 3 still has a high capture rate but a more limited range of materials means that the number of sectors influenced will be narrower. Example 2 has the wider range of materials however the more modest improvement in capture rates limits the size of the beneficial effect. Finally, Example 1 incorporates the most limited range of sectors and improvement in collection rates.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Contribution to Sector Sustainability Strategies	4	3	2	1

Factor 9: Increased footfall for retailers

4.123. When members of the public come to redeem their deposits, they are likely to spend their redeemed deposit in the store in which they receive it. Circumstantial evidence from other schemes is that if this is facilitated at a location where there are opportunities to make purchases then this is more likely.

4.124. So, where retailers are involved in facilitating this transaction, this can result in increased spending in "bricks and mortar" shops. Few opportunities exist that will both drive increased footfall and allow access to funds while in store. This could therefore help to support shops struggling with changing shopping patterns e.g. online shopping.

4.125. Example 4 would be the most positive, involving a large number of retailers with the largest number of deposits. Example 3 also includes the largest number of retailers. Example 2 has the option for some retailers to be involved and finally, Example 1 has dedicated drop-off points so would not facilitate this benefit.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Increased footfall for retailers	4	3	2	1

4.3.4 Collection efficiencies

Factor 10: Local Authority Waste Collections

4.126. Currently, the NPV captures the savings in disposal costs for Local Authorities. This is the net positive impact from a reduction in material revenues from dry recycling materials but a larger saving from avoided disposal costs in residual waste.

4.127. Given the weight and volume that would be removed, it would be reasonable to assume that there are also savings in collection costs where collection efficiency is restrained by vehicle capacity i.e. tipping multiple times in one day. This would help to create capacity within Local Government services, to cope with an increasing population and number of premises to service.

4.128. By weight the containers in scope of a DRS would represent over 8% of local authority managed waste based on 2016 Waste Data figures. Measured by volume it would be higher than this. With 2.45 million households in Scotland and an average cost per collection of £64.46[55], even a 2.5% saving would result in almost £4 million per annum.

[55] Local Government Benchmarking Framework

4.129. Example 4 would have the largest impact, with both a wide range of materials and high capture rate. Example 2 would have the next largest impact, with a wide range of materials but a more limited capture rate. This is followed by Example 3 and 1, which have an identical range of materials but capture rates of 80% and 60% respectively.

Scale of Impact: Moderate
Integrate into NPV: Possible

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Local Authority Waste Collections	4	2	3	1

Factor 11: Utilising existing facilities

4.130. At this early stage of development, it is obvious that no contracts are in place with any potential partners to provide the necessary infrastructure and logistics for delivery of a DRS. Without these contracts there is no guarantee that existing infrastructure, such as existing fleet movements or waste management facilities, could be utilised.

4.131. For the purposes of calculating the NPV, we have assumed a "worst case" scenario that none of this occurred. In reality, it is likely that a significant amount of haulage and bulking facility infrastructure could be provided using this existing infrastructure. This would reduce both the capital and operating costs for the system, while providing a valuable income stream for those involved e.g. instead of travelling empty then an existing vehicle would be earning an income.

4.132. Example 4 would benefit the most from this, as with the highest capture rate and material range this is the example with the highest storage and haulage costs. This would be followed by Example 2 (same range of materials as 4 but lower capture rate), Example 3 (same capture rate as Example 4 but with a more limited range of materials) and then Example 1 (low capture rate and limited range of materials).

Scale of Impact: Moderate
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Utilising existing facilities	4	2	3	1

Factor 12: Supporting economies of scale in collections

4.133. A national DRS would have a comprehensive infrastructure which can be utilised for a variety of purposes, without compromising the quality of materials being captured. Examples identified in discussions with stakeholders include facilitating colour separated glass collections from industrial/commercial premises in rural locations, where this is not financially feasible, and facilitating the collection of reusable bottles in parallel to material being collected for recycling by the system.

4.134. These two examples and any other similar initiatives would generate an additional income stream for the scheme, by providing economies of scale, and also additional social and economic benefits e.g. avoided carbon emissions, improved recycling quantity and quality.

4.135. Examples 4 and 3 would offer the greatest opportunities for these opportunities, with a more comprehensive collection regime due to the large number of return locations. This would be followed by Example 2 and then Example 1, with a much lower number of return locations.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Supporting economies of scale in collections	3	2	1	1

Factor 13: Non-Local Authority Litter Savings

4.136. Currently the operational savings captured in the NPV are restricted to an estimate of the Local Authority costs of picking up litter on the ground. Therefore, operational savings from clearing litter on Non-Local Authority land and savings from not having to service litter bins as frequently in both types of locations are not currently being included.

4.137. Local Authorities are responsible for 5% of non-agricultural land in Scotland however this includes the areas with the highest footfall and therefore where littering is likely to occur. There do remain areas with high footfall outside their control such as retail parks and land for other duty bodies e.g. the trunk road network, education institutions etc.

4.138. The amount of litter occurring on this other land, the composition of this and the costs associated with it are not clear. As a result, it is not possible to subtract the savings associated by diverting drinks containers from this litter stream.

4.139. Likewise the composition of waste in both Local Authority and Non-Local Authority litter bins is not known. This combined with the different ways that these bins are often serviced means that it is not possible to estimate savings from reduced servicing of these bins.

4.140. Examples 4 and then 2 would have the greatest impact, capturing the greatest range and quantity of materials. This would then be followed by 3, a narrower range of materials but high capture rate of these, and then 1, which has both a narrow range of materials and poorer capture rate.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Non-Local Authority Litter Savings	4	2	3	1

4.3.5 Social benefits

Factor 14: Involvement of 3rd Sector in Delivery

4.141. Scotland has a vibrant 3rd sector including many involved in recycling and reuse activities. These businesses bring lots of added benefits to the communities that they work in, focused on delivering their social goals instead of redistributing profits.

4.142. These organisations have existing infrastructure, experience of working in local communities and are likely to offer additional social benefits such as offering employment opportunities to young people or socially disadvantaged groups.

4.143. The number and value of contracts delivered by the third sector is dependent on the system owner and how contracts are procured once the scheme is operational. It is assumed that Example 4 is most likely to leverage involvement of the 3rd sector, due to the ongoing public sector involvement in delivery allowing for greater influence over exploiting these potential benefits. The other examples are considered equal.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Involvement of 3rd sector in delivery	2	2	2	1

Factor 15: Financial Benefits for Community organisations

4.144. The operation of a DRS offers a number of opportunities for good causes to benefit financially. In schemes operating in other countries there was evidence of community fundraising, asking people to “donate” their containers. The system operator is often involved in the sponsorship of sports teams and local activities, raising the profile of the scheme and benefiting the activities involved by making a financial contribution.

4.145. The financial value of this benefit is dependent on what activities are funded, however, all four examples could facilitate this. Example 1 would benefit the most from this, as the system operator has a substantial surplus and it is assumed this would be reinvested, followed by Example 2. Example 3 and 4 are ranked equally.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Financial benefits for community organisations	1	2	3	3

4.3.6 Wider behaviour change

Factor 16: Increase in recycling of non-DRS materials

4.146. The direct financial incentive is the primary mechanism resulting in high capture rates for DRS. In addition, however it also communicates the value, both consciously and subconsciously, about the value of materials as a resource, to a broader proportion of the population.

4.147. This contributes to the fact that these types of fiscal measures don't have to make it financially unaffordable for the public to do the wrong thing. For example, the introduction of a 5p charge on single use carrier bags in Scotland in 2014 resulted in an 80%[56] decrease in carrier bag use. This is despite this being a relatively small amount of money for large numbers of the population.

4.148. By leveraging this benefit in relation to packaging will mean that almost everyone in Scotland will be exposed to this messaging on a daily to weekly basis. Regular reinforcement that packaging has a value has the potential therefore to influence behaviour in relation to other similar materials e.g. food cans, glass jars etc.

4.149. Examples 4 and 2 have the highest impact in this regard, with the broadest range of materials in scope. Example 4 is slightly greater, as it has a higher capture rate and therefore engages people more frequently. Likewise, with Examples 3 and 1, both have more limited range of materials but Example 3 engages people more frequently.

Scale of Impact: Moderate
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Increased recycling of non-DRS materials	4	2	3	1

Factor 17: Wider behaviour change messaging

4.150. Another opportunity to influence behaviour is by utilising marketing messaging at return points, specifically to promote elements of the circular economy. These return points will be visited by the majority of the over 4 million adults in Scotland on any average week.

4.151. In marketing terms, this would therefore be high value property. In addition to the frequency that any messaging would be seen, focusing on circular economy messaging would have the added benefit of promoting activities that demonstrate the same principles as that being carried out. This increases the likelihood, that it will have a positive impact.

4.152. The introduction of a DRS presents the opportunity to further promote this idea of a wider good, using a range of communication mediums, as people regularly see their peers participating in the activity. This increases the likelihood that people will receive positive reinforcement from participating themselves.

[56] Carrier Bag Charge - One Year On, Zero Waste Scotland

4.153. The use of return point space and links to wider behaviour change messaging is likely to be determined by either the system owner, dependent on how the scheme is established and operated. If, as an example, this was used to market something like the Revolve branded reuse organisations, or Local Authority recycling services, then it is likely to result in an increase in reuse and recycling activity. This has associated economic, environmental and social benefits.

4.154. Examples 4 and 3 have the largest impact in this regard, as there are more return points and people engage with the system frequently. Example 2 has around 2,000 return points and a lower engagement and finally, Example 1 has only around 1,000 return points and the lowest engagement.

Scale of Impact: Moderate
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Utilising behaviour changing messaging at return locations	3	2	1	1

Factor 18: Improved Data Quality and Transparency

4.155. One of the limiting factors in quantifying many of the benefits identified is the lack of high quality data. This includes the lack of information on items placed onto the Scottish market, comparable information on that collected for recycling and then the end destination/use of that material.

4.156. A DRS could address all of these data weaknesses and, depending on the way that the scheme is established, could promote increased transparency on this information. In addition, this high quality data set could be leveraged to realise other societal benefits. For example, information on geographical consumption of high sugar or alcoholic drinks would enable better targeted health messaging to these locations.

4.157. Capture rate and the range of materials in scope are the primary influencers of the size of the impact from this benefit. For this reason, Example 4 is the most impactful followed by Example 3, Example 2 and finally Example 1.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Improved data quality and transparency	4	3	2	1

4.3.7 Other environmental benefits

Factor 19: Carbon Pricing

4.158. The majority of carbon savings resulting from imposition of a DRS will occur in the traded sector and therefore, the economic value attributed to these savings is

based on the current and forecasted price of carbon under the EU's Emissions Trading Scheme. It is worth noting however that these prices, at least in the short to medium term, are widely acknowledged as being too low, and are a function of credit oversupply in the ETS, rather than a proper accounting of externalities related to CO2e.

4.159. This has been acknowledged by the UK government, which has imposed an £18/tCo2e carbon price floor on companies using fossil fuels to produce electricity to 2021, in order to drive low carbon innovation. Using a similar carbon price in DRS modelling would significantly improve the net present value of the DRS modelling

4.160. If diversion of material to DRS comes more from existing recycling collection and less from residual than modelled, then the difference between scenarios would be more pronounced.

4.161. The highest impact in this regard is Example 4, followed by Example 3, Example 2 and then Example 1.

Scale of Impact: Significant
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Carbon pricing	4	3	2	1

Factor 20: Creating a Circular Economy Exemplar

4.162. One of the barriers to adopting circular economy business practices is the lack of examples of sufficient scale, to provide an exemplar to other organisations of what can be achieved and how. While there are example product ranges or categories, there are few businesses in the UK that have yet incorporated the circular economy principles as part of their business ethos.

4.163. There is an opportunity for the System Operator to deliver this exemplar for Scotland and further afield. This would provide a national example to follow and would focus on all elements of the organisation i.e. not just those that are specific to a DRS. This would demonstrate where opportunities are, without adding cost, and also create capacity for other industries to leverage in this approach.

4.164. The implementation of this approach is entirely dependent on how the system is established and operated. For that reason, it is assumed Example 4 has the most potential for this to occur, as it involves involvement from the public sector to drive this outcome. The other examples have equal impact in this area.

Scale of Impact: Minor
Integrate into NPV: Unlikely

Ranking of Examples	Example 1	Example 2	Example 3	Example 4
Creating a circular economy exemplar business	2	2	2	1

4.3.8 Assigning option scores against broad criteria set

4.165. Tables 3-9 below presents the relative ranking of the examples.

Table 3 Total score against material benefits from each example

	Material Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Improved Material Quality	4	2	3	1
Attracting processing capacity to Scotland	2	2	2	1
Influencing packaging design	3	2	3	1

Table 4 Total score against wider litter benefits from each example

	Wider Litter Benefits			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Wider Litter Impacts	4	2	3	1
Reduction in propensity to litter	4	3	2	1
Magnified impacts of litter on certain socio-demographic groups	4	2	3	1

Table 5 Total score against industry costs from each example

	Industry Costs			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Impact on producer operational efficiencies	1	2	1	2
Contribution to Sector Sustainability Strategies	4	3	2	1
Increased footfall for retailers	4	3	2	1

Table 6 Total score against collection efficiencies from each example

	Collection efficiencies			
	Example 1	**Example 2**	**Example 3**	**Example 4**
Local Authority Waste Collections	4	2	3	1
Utilising existing facilities	4	2	3	1
Supporting economies of scale in collections	3	2	1	1
Non-Local Authority Litter Savings	4	2	3	1

Table 7 Total score against social benefits from each example

	Social Benefits			
	Example	**Example**	**Example**	**Example**

	1	2	3	4
Involvement of 3rd sector in delivery	2	2	2	1
Financial benefits for community organisations	1	2	3	3

Table 8 Total score against wider behaviour changes from each example

	Wider Behaviour Change			
	Example 1	Example 2	Example 3	Example 4
Increase in recycling of non-DRS materials	4	2	3	1
Wider behaviour change messaging	3	2	1	1
Improved data quality and transparency	4	3	2	1

Table 9 Total score against other environmental benefits from each example

	Other Environmental Benefits			
	Example 1	Example 2	Example 3	Example 4
Carbon Pricing	4	3	2	1
Creating a Circular Economy Exemplar	2	2	2	1

4.4 Optimism bias

4.166. The previous section has provided a Net Present Value for four example DRS designs, based on incremental costs and benefits from a baseline where no scheme is introduced.

4.167. Following HM Treasury Green Book Guidance, in relation to optimism bias it states that:

"Project appraisers have the tendency to be over optimistic. Explicit adjustments should therefore be made to the estimates of a project's costs, benefits and duration, which should be based on data from past or similar projects, and adjusted for the unique characteristics of the project in hand.

This guidance provides cost and time uplift percentages for generic project categories which should be used in the absence of more robust primary data."

4.168. Tables 3-9 below presents the relative ranking of the examples.

4.169. HM Treasury suggested initial optimism bias uplifts for a range of project types are detailed in Table 10:

Table 10 Optimism Bias Recommended Adjustment Ranges[57]

Project Type	Optimism Bias			
	Works Duration		Capital Expenditure	
	Upper	Lower	Upper	Lower
Standard Buildings	4	1	24	2
Non-Standard Buildings	39	2	51	4
Standard Civil Engineering	20	1	44	3
Non-Standard Civil Engineering	25	3	66	6
Equipment/Development	54	10	200	10
Outsourcing	n/a	n/a	41*	0*

*the optimism bias for outsourcing projects is measured for operating expenditure.

4.170. The most similar category for the purposes of this project is the outsourcing category which is described as "concerned with the provision of hard and soft facilities management services – for example, information and communication technology services, facilities management and maintenance projects."

4.171. Accordingly, an optimism bias of 41% has been applied to the capital and operating costs of providing and running the scheme in all four examples. This impacts on the system operator costs, return point costs (if separate) and the producer costs.

4.172. The four NPV tables from Section 4.2 have been updated to reflect the application of this approach:

Example 1 (Take back to dedicated drop-off points)

Actor	Example 1 NPV (£) – Optimism Bias Applied		
	Costs	Benefits	Net benefit
System Operator	-£1,571 million	£2,499 million	£928 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,150 million	£0	-£2,150 million
Producers	-£186 million	£853 million	£667 million
Local Authorities	£0	£110 million	£110 million
Commercial Premises	£0	£23 million	£23 million
Other Sectors	-£85 million	£85 million	£0 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£768 million	£768 million
TOTAL	-£4,157 million	£4,338 million	£181 million

[57] Supplementary Green Book Guidance – Optimism Bias

4.173. The impact is a reduction in the NPV of £313 million, reducing the net benefit from £494 million to £181 million.

4.174. This is a primarily a result of the increased system operator costs, which in this example includes the return points that are operated by the scheme itself. The costs increase from £1,114 million to £1,571 million.

Example 2 (Take back to dedicated drop-off points with cartons and cups)

Actor	Example 2 NPV (£) – Optimism Bias Applied		
	Costs	Benefits	Net benefit
System Operator	-£2,941 million	£3,470 million	£529 million
Return Points	£0	£0	£0
Unredeemed Deposits	-£2,558 million	£0	-£2,558 million
Producers	-£522 million	£1,367 million	£845 million
Local Authorities	£0	£146 million	£146 million
Commercial Premises	£0	£37 million	£37 million
Other Sectors	-£153 million	£155 million	£2 million
Value of Public Contribution	-£165 million		-£165 million
Society Benefits		£1,119 million	£1,119 million
TOTAL	-£6,339 million	£6,294 million	-£45 million

4.175. The impact is a reduction in the NPV of £397 million, reducing the net benefit from £352 million to -£45 million.

4.176. Like example one, this is primarily a result of the increased system operator costs, which in this example includes the return points that are operated by the scheme itself. The costs increase from £2,086 million to £2,941 million, resulting in £398 million less net benefit for the system operator because of a closer relationship between income and costs

Example 3 (Take back to any place of purchase)

Actor	Example 3 NPV (£) – Optimism Bias Applied		
	Costs	Benefits	Net benefit
System Operator	-£1,839 million	£1,839 million	£0
Return Points	-£1,211 million	£1,211 million	£0
Unredeemed Deposits	-£545 million	£0	-£545 million
Producers	-£1,202 million	£890 million	-£312m million
Local Authorities	£0	£149 million	£149 million
Commercial Premises	£0	£31 million	£31 million
Other Sectors	-£137 million	£138 million	£1 million
Value of Public	-£165 million	£0	-£165 million

Contribution			
Society Benefits	£0	£1,038 million	£1,038 million
TOTAL	-£5,098 million	£5,296 million	£197 million

4.177. The impact is a reduction in the NPV of £548 million, reducing the net benefit from £745 million to £197 million.

4.178. This is primarily a result of increasing costs for the system operator (£183 million) and return point costs (£352 million), that are reimbursed by the system operator. This results in an increased producer cost, contributing to these increased overheads.

Example 4 (Take back to any place of purchase with cartons and cups)

Actor name	Example 4 NPV (£) – Optimism Bias Applied		
	Costs	Benefits	Net benefit
System Operator	-£1,987 million	£1,987 million	£0
Return Points	-£1,232 million	£1,232 million	£0
Unredeemed Deposits	-£860 million	£0	-£860 million
Producers	-£1,042 million	£965 million	-£77 million
Local Authorities	£0	£168 million	£168 million
Commercial Premises	£0	£42 million	£42 million
Other Sectors	-£148 million	£149 million	£1 million
Value of Public Contribution	-£165 million		-£166 million
Society Benefits		£1,285 million	£1,285 million
TOTAL	-£5,434 million	£5,828 million	£394 million

4.179. The impact is a reduction in the NPV of £596 million, reducing the net benefit from £990 million to £394 million.

4.180. This is primarily a result of increasing costs for the system operator (£220 million) and return point costs (£358 million), that are reimbursed by the system operator. This results in an increased producer cost, contributing to these increased overheads.

4.181. Table 11, summarises the changes across all four examples and the percentage change that this optimism bias has on the total NPV:

Table 11 % Change in NPV

	Current 25 year NPV	NPV (Optimism Bias Applied)	NPV % Change
Example 1	£494m	£181m	63%
Example 2	£352m	-£45m	112%
Example 3	£745m	£197m	74%

Example 4	£990m	£394m	60%

4.5 Sensitivity of costs to other factors

Possible impacts on NPV of data gaps discussed above

4.182. As identified in Section 4.3, Wider Benefits, there remain a number of costs and benefits that it has not been possible to place an accurate financial value on for inclusion in the NPV calculation.

4.183. Some of these costs and benefits could be converted into a financial value for the purposes of the FBC however a large number will remain subject to a qualitative judgement on their relative importance.

Possible impacts on NPV of changes to cost/benefit estimates already included in the model

4.184. For figures included currently within the NPV, there are a limited number of factors that are both significant enough to influence the relative scoring of the examples and have a large enough range of potential values.

4.185. As a way of assessing the sensitivity of the costs to these factors, an analysis has been conducted to look at the percentage changes required to change the ranking of examples. This is also a way of assessing the potential impact of bias in the costings of any of the capabilities on the overall performance of the examples.

4.186. The following table (Table 12) looks at the percentage change required to alter the relative position of the examples between:

1. Example 1 and 2 – the two dedicated drop-off point schemes and with the smallest gap in NPV of £142m
2. Example 3 and 4 – the two return to any place of purchase schemes and with the second smallest gap in NPV of £245m
3. Example 1 and 3 – the smallest gap, with a difference in NPV of £251m, between a dedicated drop-off point scheme and a return to place of purchase

Table 12 Percentage change required to change relative position of examples

	% change in variables to change the ranking by cost (Example 1 and 2)	% change in variables to change the ranking by cost (Examples 3 and 4)	% change in variables to change the ranking by cost (Examples 1 and 3)
System Operator Costs	7%	19%	23%
Avoided compliance costs	17%	28%	38%

Value of public contribution	86%	149%	152%
Society Benefits	13%	24%	33%

4.187. This result confirms that avoided compliance costs and the society benefits, driven by a reduction in litter, are of equivalent, or greater, importance to all system operator costs combined. This includes staff costs, infrastructure, fraud, costs associated with return points etc.

4.188. In addition, uncertainty around these system costs, which can in many cases be benchmarked against overseas systems, are less. A possible exception is the inclusion of cups, which are not currently bar-coded, and do not have any overseas comparators, but this would be a relatively small component of cost.

4.189. Uncertainty is greater for the other three factors. In particular, the marginal impact on these figures of changes in system design (particularly in relation to consumer convenience) and performance (specifically the marginal benefits of reduced littering) could differ more or less than we assume here between the scenarios. The value of the public's contribution (in terms of time, effort, etc) does not look as sensitive as the other two, however a significant range of figures has been estimated for this by different stakeholders, and the modelled scenarios do not currently vary this figure across the four examples.

4.6 Using multi-criteria analysis to select the best examples

4.190. Multi-criteria analysis (MCA) refers to a set of techniques for comparing policy examples without assigning monetary values to their impacts. MCAs are a good compliment to cost-benefit analysis (used widely across the public sector) where there is insufficient information about monetary values or deriving those is impractical.

4.191. The exercise considered how the four examples compared against a framework that had been selected to ensure that the chosen DRS in Scotland met the principles as agreed by the DRS Programme Board.

4.192. There are four principles as agreed by the Programme Board.

1. Increase the quantity of target materials recycled;
2. Improve the quality of material collected for recycling, to allow for higher value recycling;
3. Encourage wider behaviour change around materials;
4. Deliver maximum economic and societal benefit for Scotland.

4.193. The four principles are where possible measured within the NPV figures (Section 4.2). There are wider benefits across the four examples which have not yet been financially calculated and these are discussed in Section 4.3.

4.194. It was agreed that a weighing and scoring approach would be taken for principle 4, to allow a quantitative value for qualitative criteria to be presented alongside the NPV. Principle 4 was therefore split into the following criteria for scoring purposes:

(iv) Ensure a fairness for all demographic groups e.g. considering the impacts of the deposit level on households on lower incomes
(v) Maximise accessibility to all demographic groups e.g. ensure there is no need to access a private vehicle to redeem deposits
(vi) Create employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities.
(vii) Create opportunities to raise funds for charitable causes, where use of the money can have wider societal benefits.

4.195. The relative importance of each of these criteria was decided through a weighting and scoring workshop which was facilitated by an independent facilitator. Attendees representing a cross section of public interest groups were invited to attend to provide their insight and expertise to the process. The workshop facilitator guided attendees through each of the four principles and criteria to develop an agreed understanding for all present about what factors were and were not to be considered against each.

4.196. Once understanding and agreement had been reached each attendee was asked to individually score the four examples by splitting 10 marks allocated across the criteria to demonstrate their relative priority against each other. For example, attendees could place all 10 marks on one criteria or split their allocation across the four to demonstrate the relative importance of each to their organisation. The total score for each criteria was summed and divided by the number of participants to give a relative weighting to be used in the weighting and scoring of the qualitative principle. The final weightings to be used for the scoring of the examples is shown in Table 13.

Table 13 The weightings of the qualitative criteria

Qualitative Criteria	Weighting
A – Ensure a Fairness for all Demographic Groups	32%
B- Maximise Accessibility to all Demographic Groups	38%
C - Create Employment Opportunities for Socially Disadvantaged Groups	13%
D - Create Opportunities to Raise Funds for Charitable Causes	17%

4.197. Each of the individual criteria were used to score the four examples in terms of how well each example delivered against the criteria and totalled using the weightings to provide a score for each example. The scores for each criteria were assigned based on the parameters discussed at the weighting and scoring workshop as set out in the following sections.

4.198. The scoring of the criteria was informed by stakeholder discussions – one to one interviews and strategic conversations, robust data provided by stakeholders, visits to existing DRS across Europe and where appropriate model outputs.

4.7 Ensure a fairness for all demographics groups

4.199. Ensuring a fairness for all demographic groups in the development of a DRS for Scotland comprises two further sub-criteria. These are the level of the deposit paid by the consumer of a beverage in scope of the system and the product coverage of a DRS. The level of the deposit is the amount paid by a consumer when purchasing a drink which is in the scope of the DRS in a container targeted by the scheme. The product coverage of a DRS is the product categories which are within scope of the scheme for Scotland in the examples e.g. soft drinks, fruit juices, dairy etc. The examples were scored taking into account the following considerations in relation to fairness for all demographic groups.

4.200. In a DRS consumers are required to pay the deposit when purchasing a drink in a container which is in scope of the scheme which is refunded when the container is returned for recycling. There will be a period of time when a consumer has paid the deposit before returning the container to have their deposit returned. This outlay may have a disproportionate impact on low income households and consideration has been given to the relative impact on these households.

4.201. Queries were raised at the workshop linked to particular demographic groups who may be less able to retrieve their deposit and the adverse impact this may have on their finances. These included those with mobility issues and tourists. This is dealt with specifically in the following section however it does have a link to this criteria as the lower the level of deposit the lower the impact this will have.

4.202. The scoring therefore links this to the level of the deposit and the lower the deposit level the higher the score awarded as minimising the level of the deposit will minimise the amount a consumer from any demographic group will hold in deposits at any given time. Both return to dedicated drop-off point examples have a 20p deposit whereas the return to any place of purchase examples have 10p deposits. Given the higher level of deposit for return to a dedicated drop-off point, which is necessary to incentivise performance given the reduced convenience of these return locations, these examples score lower than the return to any place of purchase examples as the outlay per consumer will be higher in these examples.

4.203. Cultural diversity and language barriers were both considered within the fairness for all demographics groups. There was considered to be minimal impact in the level of deposit on cultural and language groups assuming that accessibility (the subject of a separate criteria) was equitable. Similarly, for products in scope, all drinks are considered in scope and therefore any variations in these examples do not adversely impact one demographic group over another. The difference between the examples presented in this paper is based on material types e.g. PET, glass etc rather than particular products e.g. soft drinks, fruit juices etc.

4.204. A DRS will have an impact on all consumers in Scotland and will therefore impact on all age demographics. The level of deposit is not considered to impact one age group adversely in comparison to others, allowing for the consideration of low income households in 4.3. Similarly, the products in scope does not adversely impact one age demographic versus another given that all drinks are deemed in scope in the examples presented.

4.205. Other considerations that were raised under this criteria included mobility (discussed in accessibility), gender (not considered to be impacted) and urban/rural communities (discussed in accessibility).

The scoring under this criteria for the examples presented in this OBC is shown in Table 14.

Table 14 Scoring for 'ensure a fairness for all demographic groups'

Example 1 – Take back to dedicated drop-off points 60% capture rate				**Example 2** – Take back to dedicated drop-off points and some shops (with cartons and cups) 70% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
20p, minimal impacts identified	8	32	25.6	20p, minimal impacts identified	8	32	25.6
Example 3 – Take back to any place of purchase 80% capture rate				**Example 4** – Take back to any place of purchase (with cartons and cups) 80% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
10p, minimal impacts	9	32	28.8	10p, minimal impacts	9	32	28.8

identified				identified			

4.8 Maximise accessibility to all demographic groups

4.206. Maximising accessibility to all demographic groups in a DRS for Scotland comprised three sub-criteria. These are the total number of return points, the physical location of the return points and the design of the return points.

4.207. The first of these further sub-criteria was the total number of return points i.e. places where a consumer can return a container to receive their deposit back. The definition of a 'return point' varies by example. For take back to any place of purchase it includes all premises where a drink can be purchased (retail including but not restricted to supermarkets, newsagents, kiosks etc and hospitality including but not restricted to pubs, restaurants, event venues, social and sports clubs, schools, universities etc). The return to a dedicated drop-off point examples utilise return points designed and sited solely to act as return location for a DRS in Scotland. The number of sites varies by example.

4.208. The number of return points is linked to accessibility in that the greater the number of return points the greater the likelihood that they are accessible. For the examples, both place of purchase examples have 17,407 return points, take back to dedicated drop-off points has 1,058 return points and take back to dedicated drop-off points (with cartons and cups) 2,009 locations. Evidence from existing systems suggests the majority of returns are made to larger retailers so the relationship between increasing the number of return points and improved accessibility/convenience is not directly proportional. For this reason, any example with greater than 5,000 return points is treated equally. At the lower end of the scale any examples with less than 1,000 return locations will score zero.

4.209. The number of dedicated drop-off points for the examples presented was based on at least one point for every settlement with a population of 1,000 or more. Even with this distribution this leaves a number of settlements not served by a return location and therefore accessibility is likely to be reduced in rural locations in particular. Accessibility is likely to be negatively impacted in these scenarios when the number of return points are reduced. The DRS needs to provide for Scotland as a whole and those without access to a major population centre will be limited in their examples of returning of locations and therefore potentially disadvantaged in comparison to more populated areas of Scotland.

4.210. The location is the second sub-criteria which is scored. Location is focused on public accessibility rather than geography and being able to confirm that return locations are positioned in locations which are accessible for consumers. The examples which have a retail return location have the greatest level of accessibility

for consumers as they are known to purchase drinks in these locations and access for purchasing goods e.g. opening hours, is generally provided in line with consumer demand. Providing return locations in environments where drinks are purchased ensures that deposits can be redeemed prior to further purchases being made by the consumer and the need for additional journeys is minimised.

4.211. Where dedicated drop-off points will be required to be sited within a certain distance of retail establishments but there can be no guarantee of the proximity of these given the need to retrofit infrastructure into available space and it is likely that this will vary on a case by case basis. Given this it is considered that dedicated drop-off points will be less available to consumers and therefore less accessible, the dedicated drop-off point examples score fewer points relative to the place of purchase examples.

4.212. The final sub-criteria is the return point design. This focuses on the opening times and availability of staff support for consumers redeeming deposits. As a minimum it is considered that any return location will be suitable for all demographics and comply with all necessary legislation/requirements to ensure this.

4.213. Place of purchase examples assume that the return points are available to the consumer at all times that the establishment is open for purchases to be made. As this is the case and staff are always on site when the establishment is open accessibility is considered to be maximised in these circumstances.

4.214. Dedicated drop-off points in the examples are considered to provide at least an element of the requirements outlined above for accessibility. This is based on a staff member being on site at some times of the day (one staff member per three locations) and the locations being available between 8 am and 8 pm (additional opening hours could be provided however these would be at a higher modelled cost).

4.215. The discussion above assumes that all return locations comply with all necessary legislation, communication supports speakers of English and languages other than English and machines are accessible for those with disabilities or reduced mobility. Reduced accessibility in terms of number of locations accounts for reduced accessibility across the demographic groups.

4.216. The scoring under this criteria for the examples presented in this OBC is shown in Table 15.

Table 15 Scoring for 'maximise accessibility to all demographic groups'

Example 1 – Take back to dedicated drop-off points 60% capture rate	**Example 2** – Take back to dedicated drop-off points and some shops (with cartons and cups) 70% capture rate

Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
1058 drop- off points, all towns over 1000 people, 8am-8pm, 3 dedicated return points per FTE	4	38	15.2	2009 drop- off points, proximity to retailers, 8am-8pm, 3 dedicated return points per FTE	6	38	22.8
Example 3 – Take back to any place of purchase 80% capture rate				**Example 4** – Take back to any place of purchase (with cartons and cups) 80% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
17407 drop-off points, align with retail opening, staff on site, certain public have access to location	10	38	38	17407 drop-off points, align with retail opening, staff on site, certain public have access to location	10	38	38

4.9 Create employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities

4.217. Creating employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities focussed on three sub-criteria. These were the total number of jobs available, the availability of a support network and the type of ownership of the central system.

4.218. The first component scored was the total number of employees required by the DRS in Scotland. A DRS requires a number of roles to be fulfilled in order for the scheme to function. All examples presented require a central system operator to manage the system centrally and coordinate logistics, material processing and material sales. These jobs will be predominately in one location within Scotland.

4.219. All examples require reverse vending machines and these require an element of servicing to maintain the machines. Employment will be created in this industry to satisfy this demand with a greater number of FTEs required in the return to any place of purchase examples due to the greater number of machines. It is anticipated that this employment will be across Scotland related to the number of machines in each region.

4.220. Take back to dedicated return point examples additionally require a member of staff per 3 dedicated points to open the site at 8 am and close the site at 8 pm. In addition this member of staff will have responsibility for assisting members of the public when on site and maintaining the general upkeep of the dedicated point. This employment will be distributed across Scotland.

4.221. The highest number of employees required to operate the system, 989, is in the take back to dedicated points (with cartons and cups) example due to the requirement to provide staff to the network of dedicated points. The take back to dedicated points example requires 526 employees overall which is reduced as the number of dedicated return points is reduced by half. The return to any place of purchase (with cartons and cups) example requires 116 employees and return to any place of purchase requires 107 employees. The difference between the two place of purchase examples is explained by the greater number of containers requiring processing and therefore sorting by the system in the enhanced example.

4.222. The scoring of the support network availability sub-criteria is based on the proportion of jobs which are located in the one location. The greater the proportion of jobs which are in one location the greater the support network and therefore the greater the likelihood that jobs can be targeted to socially advantaged groups. The place of purchase examples have almost all the jobs centrally located and therefore score better in this sub-criteria. A significant proportion of employment is assigned to the dedicated points and are therefore not centrally located and this is reflected in the score for these examples.

4.223. The type of ownership has been used to assess the likelihood that jobs will be targeted to long term unemployed or those with disabilities. It has been considered that the likelihood of these demographics being actively promoted within the recruitment phase when the scheme is in operation is greater under public ownership than private ownership. It is not to say that it would not happen under private ownership but within the public ownership model particular targets or policies can be actively adopted to promote these practices. The example with public ownership modelled is take back to any place (with cartons and cups). Take back to

dedicated points, take back to dedicated points (with cartons and cups) and take back to any place of purchase are modelled as industry owned.

4.224. The scoring under this criteria for the examples presented in this OBC is shown in Table 16.

Table 16 Scoring for 'create employment opportunities for socially disadvantaged groups such as the long term unemployed or those with disabilities'

Example 1 – Take back to dedicated drop-off points 60% capture rate				**Example 2** – Take back to dedicated drop-off points and some shops (with cartons and cups) 70% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
526 jobs, 435 internal across all return points, industry owned	5	13	6.5	989 jobs, 816 internal across all return points, industry owned	6	13	7.8
Example 3 – Take back to any place of purchase 80% capture rate				**Example 4** – Take back to any place of purchase (with cartons and cups) 80% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
107 jobs, 99 in a single location, industry owned	6	13	7.8	116 jobs, 108 in a single location, public owned	7	13	9.1

4.10 Create opportunities to raise funds for charitable causes, where use of the money can have wider societal benefits.

4.225. Creating opportunities to raise funds for charitable causes, where use of the money can have wider society benefits is the final criteria. This comprises of two further sub-criteria whether the DRS creates the option for the public to donate their redeemed deposit to a charitable cause and whether there is a mechanism for a direct donation of unredeemed deposits by the system operator.

4.226. When a consumer returns their container to a return point for recycling they are entitled to their deposit in return. In other existing schemes across Europe and the rest of the world the option is often provided for the consumer to make the choice of accepting their deposit back or donating it to a charitable cause. Charitable causes can include charities, sports clubs or any other scheme providing wider societal benefit. These can either be locally decided (on a return point by return point basis) or on a national basis.

4.227. All examples which include an element of reverse vending machines can allow charitable donations to be made in lieu of the customer getting the deposit back. All the examples presented here require the use of automated return points and are therefore capable of allowing for charitable donations by consumers when returning their containers for recycling. In other countries this formal ability to donate to charity is supplemented by an informal approach where schools and charitable organisations can collect containers and receive the deposits back from the system operator.

4.228. The second component is for the option for the operator of the scheme to donate a proportion of unredeemed deposits to a charitable cause of either the public's or the schemes choosing. The main funding mechanisms of all the examples presented are unredeemed deposits, material values and a fee levied on producers for any shortfall. In workshops with the stakeholders of a DRS in Scotland it was clear that their view was that no funding should be removed from the system for other causes. As such no example has been taken forward for the scheme donating a proportion of deposits to a charitable cause.

4.229. The scoring under this criteria for the examples presented in this OBC is shown in Table 17.

Table 17 Scoring for 'create opportunities to raise funds for charitable causes, where use of the money can have wider societal benefits'

Example 1 – Take back to dedicated drop-off points 60% capture rate	**Example 2** – Take back to dedicated drop-off points and some shops (with cartons and cups)

				70% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
RVM allows donation, no scheme donation	5	17	8.5	RVM allows donation, no scheme donation	5	17	8.5
Example 3 – Take back to any place of purchase 80% capture rate				**Example 4** – Take back to any place of purchase (with cartons and cups) 80% capture rate			
Relevant Parameters	Score (out of 10)	% Weight	Weighted Score	Relevant Parameters	Score (out of 10)	% Weight	Weighted Score
RVM allows donation, no scheme donation	5	17	8.5	RVM allows donation, no scheme donation	5	17	8.5

4.11 Assigning example scores

4.230. The total weighted scores of the Examples are shown in Table 18 below. Alongside the total score is the overall relative qualitative rank of the examples. The "Take back to any point of Purchase (with cartons and cups)" example scored the highest out of the presented examples and therefore is ranked first. "Take back to any point of purchase" was second by one mark which was linked to the enhanced employment opportunities for long term unemployed and disabled offered by public ownership.

Table 18 Ranking of examples from weighting and scoring

Example	Weighted Score	Rank
1. Take back to dedicated drop-off points Plastic, glass and metal 20p 60% capture rate	56	4

2. Take back to dedicated drop-off points and some shops (with cartons and cups) All materials 20p 70% capture rate	65	3
3. Take back to any point of purchase Plastic, glass and metal 10p 80% capture rate	83	2
4. Take back to any point of purchase (with cartons and cups) All materials 10p 80% capture rate	84	1

5. Financial case

5.0. Each of the four Examples outlined in Section B provide the functions required to deliver the principles of the Programme. This section provides information on the financial requirements for delivering the four example scheme designs.

5.1. It should be noted that this document should not be used for future budgetary planning, as the actual costs are dependent on the final scheme design and a series of commercial negotiations across different stakeholders.

5.2. These figures are useful however as an aid to decision making, demonstrating the likely costs of different approaches, where the differences between the examples on a like for like basis are more important than the absolute figures.

5.3. DRS in other countries are funded by a mixture of three separate income streams: unredeemed deposits, the sale of materials and producer fees. The level of unredeemed deposits is usually the largest of these and is predictable to forecast based on scheme performance after the scheme has been established. The sale of materials is the most volatile income stream as it is subject to changes in international markets however existing schemes are able to manage any volatility on a year by year basis by making adjustments to producer fees.

5.4. Initial capital costs will require funding, utilising either a commercial loan or loans from stakeholders involved in the system operation. These are usually short term, for less than 12 months, as deposits for containers that enter the supply chain in year one provide sufficient liquidity to allow the system operator to repay these. Future capital cost payments would be integrated into producer fees, to ensure sufficient reserves are available to cover these costs.

Estimated Costs of Example 0: No Deposit Return Scheme is introduced

5.5. For the purposes of calculating the Net Present Value of different Deposit Return Schemes, the baseline (Example 0) is presented as zero. The costs and benefits in examples 1-4 are then incremental costs and benefits from this fixed point.

Estimated Costs of Example 1: Take Back to Dedicated Drop-Off Points

5.6. This example assumes that glass bottles, metal cans and PET plastic bottles are the materials in scope. With a deposit level of 20p and 1,058 return locations established across the country, achieving a capture rate of 60%.

5.7. Based on these assumptions, the costs and benefits have been calculated for this example deposit return scheme. The following section provides a breakdown of the capital costs associated with this design and operational costs for a single “example” year.

5.8. The capital costs for establishing the system under this is example is £101 million. This is primarily the costs associated with the 1,058 return locations (£94 million) and construction of a bulking centre (£7 million).

5.9. It is assumed that most of the capital associated with return point infrastructure has a lifespan of 7 years. As a result, the majority of this cost is incurred every 7 years as part of a replacement cycle.

5.10. In an example year, the operating costs incurred by the System Operator are approximately £43 million per annum. This incorporates operating the return locations, a central bulking facility, logistics, cost of fraud, communications and staff employed directly by the system.

5.11. The value of unredeemed deposits under this example is £126 million. The range of materials in scope of this scheme results in over 1.5 billion containers being placed onto market and, with a 60% capture rate, this results in around 626 million containers, each with a 20p deposit, not being captured.

5.12. The value of materials collected by the system operator is estimated to be £6 million. This would form an income stream for the system owner, derived from selling large quantities of high quality material streams of glass, PET, aluminium and steel.

5.13. Therefore, in this example the income from revenue from unredeemed deposits and sales of materials would exceed the operating costs for the system.

5.14. It is assumed that the system is established as a “not for profit” company however no assumptions have been made about how any “surplus” from the system would be redistributed or what this would be utilised for.

Estimated Costs of Example 2: Take back to dedicated drop-off points and some shops (with cartons and cups)

5.15. This example assumes a broad range of materials are in scope; glass bottles, metal cans, plastic bottles, beverage cartons and disposable cups. With a deposit level of 20p and 2,009 dedicated drop-off points established, within a proximity of points where drinks containers are purchased, a capture rate of 70% is modelled.

5.16. Based on these assumptions, the costs and benefits have been calculated for this example DRS. The following section provides a breakdown of the capital costs associated with this design and operational costs for a single “example” year.

5.17. The capital costs for establishing the system under this is example is £185 million. This is primarily the costs associated with the 2,009 return locations (£178 million) and construction of a bulking centre (£7 million).

5.18. It is assumed that most of the capital associated with return point infrastructure has a lifespan of 7 years. As a result, the majority of this cost is incurred every 7 years as part of a replacement cycle.

5.19. In an example year, the operating costs incurred by the System Operator are approximately £74 million. This incorporates operating the return locations, a central bulking facility, logistics, cost of fraud, communications and staff employed directly by the system.

5.20. The value of unredeemed deposits under this example is £149 million. The range of materials in scope of this scheme results in over 2.5 billion containers being covered and, with a 70% capture rate, this results in around 750 million containers, each with a 20p deposit, not being captured.

5.21. The value of materials collected by the system operator is estimated to be £7.2 million. This would form an income stream for the system owner, derived from selling large quantities of high quality material streams of glass, PET, HDPE, aluminium, steel and composite materials from beverage cartons and cups.

5.22. Therefore, in this example the income from revenue from unredeemed deposits and sales of materials would exceed the operating costs for the system.

5.23. It is assumed that the system is established as a “not for profit” company however no assumptions have been made about how any “surplus” from the system would be redistributed or what this would be utilised for.

Estimated Costs of Example 3: Take back to any place of purchase

5.24. This example assumes a broad range of materials are in scope; glass bottles, metal cans and PET plastic bottles. With a deposit level of 10p and return locations located at any premise that sells these containers, achieving a capture rate of 80%.

5.25. Based on these assumptions, the costs and benefits have been calculated for this example DRS. The following section provides a breakdown of the capital costs associated with this design and operational costs for a single “example” year.

5.26. The capital costs for establishing the system under this is example is £76 million. This is primarily the costs associated with the purchase of RVMs for return points (£64 million) and construction of a counting centre and bulking points (£12 million).

5.27. In an example year, the operating costs incurred by the System Operator are approximately £67 million. This incorporates counting and bulking centres, logistics, cost of fraud, communications, staff employed directly by the system and handling fees paid to return point operators.

5.28. Handling fees paid account for £42 million of the system operator costs. This assumes that operating a return point should be cost neutral, reimbursing retailers for staff time, the value of any lost retail space, miscellaneous supplies and, where an automated solution is used, the cost of maintaining and operating the reverse vending machine.

5.29. The value of unredeemed deposits under this example is almost £31.5 million. The range of materials in scope of this scheme results in 1.55 billion containers being placed onto market and, with an 80% capture rate, this results in 310 million containers, each with a 10p deposit, not being captured.

5.30. The value of materials collected by the system operator is estimated to be £8 million. This would form an income stream for the system owner, derived from selling large quantities of high quality material streams of glass, PET, aluminium and steel.

5.31. The annual cost of "producers" contribution to this system would be £27.5 million. This is calculated as the shortfall in revenue required to cover system operating costs (£67 million) after deducting unredeemed deposits and material value (£31.5 million and £8 million).

5.32. This "producer fee" to the annual cost equates to an average of 1.77p on each container in scope of this example scheme.

5.33. However, as highlighted in Chapter 4, "producers" will benefit by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy Package. This will equate to an average of 3.48p on each container in scope of this example scheme.

Estimated Costs of Example 4: Take back to any place of purchase (with cartons and cups)

5.34. This example assumes a broad range of materials are in scope; glass bottles, metal cans, plastic bottles, beverage cartons and disposable cups. With a deposit level of 10p and return locations located at any premise that sells these containers, achieving a capture rate of 80%.

5.35. Based on these assumptions, the costs and benefits have been calculated for this example DRS. The following section provides a breakdown of the capital costs associated with this design and operational costs for a single "example" year.

5.36. The capital costs for establishing the system under this is example is £78 million. This is primarily the costs associated with the purchase of RVMs for return points (£64 million) and construction of a counting centre and bulking points (£14 million).

5.37. In an example year, the operating costs incurred by the System Operator are approximately £72.5 million. This incorporates counting and bulking centres, logistics, cost of fraud, communications, staff employed directly by the system and handling fees paid to return point operators.

5.38. Handling fees paid account for £42.5 million of the system operator costs. This assumes that operating a return point should be cost neutral, reimbursing retailers for staff time, the value of any lost retail space, miscellaneous supplies and, where an automated solution is used, the cost of maintaining and operating the reverse vending machine.

5.39. The value of unredeemed deposits under this example is almost £50 million. The range of materials in scope of this scheme results in 2.5 billion containers being placed onto market and, with an 80% capture rate, this results in 500 million containers, each with a 10p deposit, not being captured.

5.40. The value of materials collected by the system operator is estimated to be £8.1 million. This would form an income stream for the system owner, derived from selling large quantities of high quality material streams of glass, PET, HDPE, aluminium, steel and composite materials from beverage cartons and cups.

5.41. The annual cost of "producers" contribution to this system would be £14.4 million. This is calculated as the shortfall in revenue required to cover system operating costs (£72.5 million) after deducting unredeemed deposits and material value (£50 million and £8.1 million).

5.42. This "producer fee" to the annual cost equates to an average of 0.57p on each container in scope of this example scheme.

5.43. However, as highlighted in Chapter 4, "producers" will benefit by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy Package. This will equate to an average of 2.34p on each container in scope of this example scheme.

Summary of Cost Ranges

5.44. The capital costs associated with implementation of the scheme range from £76 million (Example 3) to £185 million (Example 2).

5.45. The ongoing running costs for delivery of the scheme range from £43 million (Example 1) to £74 million (Example 2).

5.46. The proportion of costs covered by unredeemed deposits range from 47% (Example 3) to 201% (Example 2)

5.47. The proportion of costs covered by "producers" range from 0% (Example 1 and 2) to 41% (Example 3)

5.48. Where a proportion of costs are covered by "producers", in Examples 3 and 4, the benefits accrued by avoiding future compliance costs associated with the implementation of the European Commission's Circular Economy package is always greater.

5.49. The financial impact on a particular sector will be determined by the definition of "producers" i.e. the range of actors who will be required to contribute to these costs.

6. Commercial case

6.0. This section contains the commercial case for the introduction of a DRS in Scotland. It evaluates the risk of each of the examples to help decision making. As the procurement path will be determined by system ownership, which varies by example, this section does not go into significant detail on the potential procurement strategy for each of the four examples. More detailed information will be provided as part of the Full Business Case.

6.1 Overview

6.1. Zero Waste Scotland has been at the heart of facilitating advice, research, and expert stakeholder opinion to inform policy decisions in this area. In Spring 2015, ZWS published a review of a feasibility study[58], that was carried out on behalf of ZWS. The feasibility study[59] looked at the benefits and challenges of introducing a DRS in Scotland. The same year ZWS carried out a call for evidence on the issue from stakeholders. In 2017, ZWS published a further summary report[60] in response to issues raised from the evidence submitted.

6.2. The introduction of a DRS in Scotland will impact on those actors within the drinks supply chain, and therefore the introduction of a scheme should be attractive to the market, be procured successfully and be commercially viable.

6.2 Summary of comparable collection operations

6.3. This section of the OBC focuses on comparable waste and recycling collections and deposit return schemes currently in operation, looking at population size, materials in scope and return method.

6.2.1 Recycling in Scotland

6.4. The collection of household recycling in Scotland is devolved to local government. The 32 Local Authorities in Scotland are responsible for the collection and sorting of waste in their area. In 2016 over 2.5 million tonnes of household material was generated[61]. The DRS operator is expected to capture between 87,000 and 135,000 tonnes of material. Based on 2016 figures, the DRS operator would sit

[58] Review of a feasibility study for a Deposit Return System for Drinks Containers
[59] A Scottish Deposit Refund System for Scotland
[60] Deposit Return Evidence Summary
[61] Household Waste 2016, SEPA

amongst the top 10 Local Authorities in regard to quantities of waste generated in Scotland, depending on scheme design[62].

6.5. It is estimated that the operation of a Scottish DRS will require between 99 and 816 FTEs. How this compares to existing organisations in Scotland is set out below.

6.6. In 2017, 3,855 enterprises (registered and unregistered in Scotland; excluding central and local government) had between 50 and 249 employees, while 2,365 enterprises (registered and unregistered in Scotland; excluding central and local government) had over 250 employees in 2017[63]. In 2017 there were 45 enterprises in the waste collection, treatment and disposal activities and materials recovery sector with over 50 employees (excluding central and local government), with this sector having a total Scottish employment figure of 6,010[64].

6.2.2 Deposit Return Schemes around the world

6.7. A 2016 report published by Reloop[65] provides an overview of 38 different deposit return schemes currently in operation around the world. In Europe 133.1 million inhabitants have access to DRS, while in North America 121.9 million inhabitants have access[66].Several examples of deposit return schemes in countries that have comparable features to the examples presented in this OBC are outlined below.

Europe:

6.8. Across Europe, with the exception of Iceland, the various deposit return scheme's currently in operation follow a return to a place of purchase model where the consumer returns their empty drinks container to a retail location. Table 19 shows which countries across Europe currently have a DRS, their population and when the DRS mandate was implemented.

6.9. For comparison the population of Scotland has been added at the bottom of Table 19. With the exception of Norway and Sweden all collect glass, and also, metal cans and plastic bottles (with most predominantly collecting PET). The Netherlands only collect plastic bottles. The systems in operation across much of Europe are similar to those presented in Example 3 (take back to any place) in Section B. All have a centralised clearing system, with the exception of Germany where a decentralised model is in place. The clearing system can be defined as "*the*

[62] Household Waste 2016, SEPA
[63] Businesses in Scotland, 2017
[64] Businesses in Scotland, 2017
[65] Deposit Systems for One-Way Beverage Containers – A Global Overview; Reloop 2016
[66] Deposit Systems for One-Way Beverage Containers – A Global Overview; Reloop 2016

entity responsible for reconciling the deposits paid/redeemed"[67]. The capture rate for these schemes varies by country and is between 80-95%.

Table 19 Existing DRS across Europe (excluding Iceland).

Country	Population (millions)	Mandate Enacted	Mandate Implemented
Croatia	4.3	2005	2006
Denmark	5.6	2000	2002
Estonia	1.3	2004	2005
Finland	5.4	N/A	1996, 2008 (PET), 2012 (Glass)
Germany	81.9	1991	2003
Lithuania	3.0	2014	2016
Netherlands	16.8	2003	2005
Norway	5.0	1999	1999
Sweden	9.5	1982,1991 (PET)	1984, 1994 (PET)
Scotland	*5.4*[68]	N/A	N/A

North America, Iceland and Australia

6.10. Across those states in North America and Australia where a DRS is in operation a 'Depot Model' (dedicated drop-off points) is the most prevalent method of return. This model can also be seen in Iceland. Under a depot model, consumers return their empty drinks containers to dedicated drop-off points, with such locations tending to be established where sufficient quantities of materials arise. Such DRS models tend to have a return rate of between 50-60% (with the exception of rural locations with small populations) and have similarities with Example 1 in Section B.

California, Maine and British Columbia:

6.11. While the majority of North America follows a depot model there are some examples of a 'hybrid' DRS. Under such systems, retailers are required to ensure that a dedicated drop-off point is located within a set proximity to their premise or accept containers for return directly. The return rate for containers within these schemes can be up to 80% and has similarities with Example 2 in Section B.

6.2.3 The inclusion of additional materials

6.12. While the inclusion of plastic, which is predominately PET, metals and glass is common across other deposit return schemes, the collection of other drinks containers under DRS is less common. The materials included in those countries where DRS has been established for a number of years tend to be included for historical reasons. These schemes were set up by industry, and the materials included reflect those industries involved in establishing the scheme.

[67] Deposit Systems for One-Way Beverage Containers – A Global Overview; Reloop 2016
[68] National Records of Scotland

6.13. A number of DRS across Europe do not include dairy and strong alcohol. This is due to a combination of factors including the focus of those schemes being primarily on litter and concerns raised by industry.

6.14. Strong alcohol is not included in some countries due to the technology installed by the scheme which is unable to recognise the variety of shapes and sizes used for spirits bottles. Reverse vending technology has however developed since these schemes were introduced and a range of RVMs are now able to recognise obscure and unique bottle shapes and sizes.

6.15. Some states in North America include beverage cartons, however the range of materials suggested under Examples 2 and 4 (see Section B) are not seen elsewhere, and would set Scotland in a position as a pioneer. These schemes across North America tend to follow a return to depot model where a redemption centre acts as the return location. Such materials tend not to be included in established DRS across Europe where a return to retail model is in place, and conversations with overseas operators in Europe suggest this is due to the technology available at the time the scheme was introduced. ZWS is in communication with machine manufactures as to the feasibility of including a wide range of materials in a Scottish DRS.

6.3 Commercial risks

6.16. This section of the OBC compares the commercial risks for each of the four example schemes and the do-nothing or Example 0. Input to the commercial case is based on what is currently known of the examples presented in Section B. The commercial case does not validate the costings attributed to each of the examples within the financial case detailed in Section C.

6.17. The commercial case does not specifically address all the commercial risks relating to the future arrangements for delivery of a DRS. A further analysis of these risks will be required once all aspects of scheme design are known.

6.18. DRS has the potential to impact on those commercial businesses who may form part of the deposit return supply chain. A feasibility study commissioned by ZWS[69] suggests DRS may have the following impacts:

- Beverage Industry: Commercial risks may, depending on scheme design, include those for changing labelling on containers; stock keeping costs; administrative costs and; producer fees.
- Retailers (on-trade): Commercial risks may, depending on scheme design, include storage issues and associated staff time

[69] Review of feasibility study for a Deposit Return System for Drinks Containers

- Retailers (off-trade): Commercial risks may, depending on scheme design, include the installations and operation of associated DRS machinery; space and staff time
- Retailers (small): Commercial risks may, depending on scheme design, include staff time and storage implications
- MRF Operators and Local Authorities: Commercial risks may, depending on scheme design, include changes in material quantities from household recycling collections and changes to current contracts.

6.19. The commercial risks (high, medium or low) relating to a DRS in each example presented are discussed below from the perspective of the system operator.

Example 0 – No scheme is introduced / do-nothing

6.20. Example 0 has been presented as a base case for comparison. As it does not introduce a system there is no additional commercial risk to consider.

Example 1 – Take back to dedicated drop-off points

6.21. All DRS examples will require upfront investment to purchase the necessary infrastructure, staff the implementation and communicate the introduction of the scheme. Example 1 has the 2nd highest infrastructure costs borne by the system operator as they are responsible for the dedicated drop-off points, which is discussed further below. This initial capital investment could be funded utilising either a commercial loan or loans from stakeholders involved in the system operation. Given the high level of initial investment this is a significant risk to the operator.

6.22. Example 1 requires 1,058 dedicated drop-off points to be installed prior to the launch of a DRS. The system operator will require to identify suitable locations which provide maximum accessibility and coverage for this number of points across Scotland. It is anticipated that these will be sited in publicly accessible areas and the system operator will require to negotiate the siting of these points prior to their installation with the landowner and comply with the necessary planning requirements. There is a risk that this could be a significant undertaking for the operator in advance of the scheme being implemented with each site potentially being the subject of negotiation. This poses a higher risk than requiring any place of purchase to collect containers as in Examples 3 and 4 given that these locations already exist.

6.23. Any DRS being implemented will require a level of procurement. For example, there will be a need for a central IT system, the development of a counting centre, bulking sites and a logistics operation. Given the scope of Example 1 this would provide the simplest procurement exercise as its scale is smaller than other examples. It is not anticipated that the procurement itself would take less time however the scope would be simpler as the counting centre would be smaller, given the fewer containers collected and the logistics operation would only require to collect from 1,058 system owned sites. There is however a risk that the design and

build of any infrastructure required to operate the scheme may impact on the timescale for introducing a DRS.

6.24. All the examples require an element of set up prior to the implementation of a DRS in Scotland. For each example a database will need to be established of all the drinks sold in Scotland which the system operator will be responsible for maintaining and will work with producers to build. It is this database that will confirm that a container being returned is in the scope of the scheme and that a deposit should be refunded. This database therefore needs to be available to all machines accepting containers prior to the implementation of the scheme. Any risk associated with the development of such a database is consistent across Examples 1 and 3, and 2 and 4, given the scope of containers in each is the same. Examples 1 and 3 would be simpler given they are assumed to not include HDPE, cartons or cups. Example 1 does not require a database of retailers participating to develop and maintain the logistics operation as all sites are assumed to be operated by the scheme which simplifies this process, and therefore reduces the risk further.

6.25. The system operator will require to recruit staff to operate the DRS across all the examples. Example 1 requires the 2nd most staff as they are required to maintain the dedicated drop-off points and significantly more FTEs than Examples 3 and 4. This is a risk for the operator in both recruiting staff and maintaining their employment versus the return to any place models which will be resourced by existing staff being supported by any additional staff deemed necessary by the return point retailer.

6.26. In all schemes there is a risk that the assumed return rate is not achieved by the scheme. Example 1 has a lower assumed return rate of 60% however the convenience of the drop-off points is unknown at this time so this rate may not be achievable. There is a risk that this would leave the system operator with a larger surplus than anticipated in this OBC. No recommendation has been made on what this surplus should be used for however given the packaging targets will not be met it could be reinvested in the scheme to drive higher return rates.

6.27. A DRS is partly funded by the value of the material which is collected for recycling. The value of the material is the subject of market forces and may vary. Any change, positive or negative, in funding caused by the varying value of material would be offset by a variable fee levied on the producer. The risk of there being a funding shortfall due to material prices is low in Example 1 given the overall surplus from the large amounts of unredeemed deposits.

6.28. With any DRS there is the potential for fraud to take place either in underreporting of products put onto the market by producers or the returning of containers for a deposit refund which has not had the deposit paid on it initially. The fraud measures across all examples in this OBC are consistent in that a specific Scottish label has been assumed necessary for all.

6.29. The material collected through a DRS is of higher quality than material collected through kerbside or similar collection systems currently in place in

Scotland. There is however always a risk that end markets will vary their specifications for material. Example 1 targets material traditionally targeted by existing recycling collections. The risk of material collected through this example not being accepted by end processors is low.

6.30. Time will be required to implement any of the four examples presented in this OBC. The negotiation and installation of dedicated drop-off points, as outlined above, may be significant but the logistics of this example would be simpler given there are only 1,058 sites. The opposite may be true for Examples 3 and 4. Given this, no determination has been made to differentiate the risk of the timeframe to implement each of these examples.

6.31. Due to the necessity to fund and install dedicated drop-off points as well as recruit a significant number of staff the commercial risk rating for the system operator under Example 1 is 'Medium - High'.

Example 2 – Take back to dedicated drop-off points and some shops (with cartons and cups)

6.32. The model as seen in Example 2 would be established by regulation with retailers mandated to ensure a dedicated drop-off point is located within a set proximity to their premises or accept containers directly for return. As described in Example 1, all DRS examples will require upfront investment to purchase the necessary infrastructure, staff the implementation and communicate the introduction of the scheme. Example 2 has the highest infrastructure cost borne by the system operator as they are responsible for the dedicated drop-off points, which is discussed further below. This initial capital investment could be funded utilising either a commercial loan or loans from stakeholders involved in the system operation. Given the high level of initial investment this is a significant risk to the operator.

6.33. Example 2 requires 2,009 dedicated drop-off points to be installed prior to the launch of a DRS. The system operator will require to identify suitable locations, with support from large retailers where appropriate, which provide maximum accessibility and coverage for this number of points across Scotland. It is anticipated that these will be sited in publicly accessible areas as well as some retail environments. The system operator will require to negotiate the siting of these points prior to their installation with the landowner and comply with the necessary planning requirements or liaise with retailers where a point is not provided to ensure they are providing a site. There is a risk that this could be a significant undertaking for the operator in advance of the scheme being implemented with each site potentially being the subject of negotiation. This poses a higher risk than Example 1 given the greater number of points and then requiring any place of purchase to collect containers exclusively as in Examples 3 and 4 given that these locations already exist.

6.34. Any DRS being implemented will require a level of procurement. For example, there will be a need for a central IT system, the development of a counting centre, bulking sites and a logistics operation. The scope of Example 2 is greater than that of Example 1, as it includes more containers. It is not anticipated that the

procurement itself would take more time however the scope would be more complex as the counting centre would be larger, given the greater number of containers collected and the logistics operation would require to collect from almost double the number of sites. As with Example 1 there is a risk that the design and build of any infrastructure required to operate the scheme may impact on the timescale for introducing a DRS.

6.35. All the examples require an element of set up prior to the implementation of a DRS in Scotland. For each example a database will need to be established of all the drinks sold in Scotland which the system operator will be responsible for maintaining and will work with producers to build. It is this database that will confirm that a container being returned is in the scope of the scheme and that a deposit should be returned. This database therefore needs to be available to all machines accepting containers prior to the implementation of the scheme. Any risk associated with the development of such a database is consistent across Examples 1 and 3 and 2 and 4 given the scope of containers in each is the same. Examples 2 and 4 would be more complex and resource intensive given they are assumed to include HDPE, cartons and cups. Example 2 also requires retailers to provide a site where one is not located nearby. This necessitates a database of retailers participating to develop and maintain the logistics operation as not all sites are assumed to be operated by the scheme which increases this risk of this example.

6.36. The system operator will require to recruit staff to operate the DRS across all the examples. Example 2 requires the most staff across all the examples as they are required to maintain the 2,009-dedicated drop-off points. This is a risk for the operator in both recruiting staff and maintaining their employment versus Examples 3 and 4 which will be resourced by existing staff being supported by any additional staff deemed necessary by the return point retailer.

6.37. In all schemes there is a risk that the assumed return rate is not achieved by the scheme. Example 2 has an assumed return rate of 70% which is lower than Examples 3 and 4. However the convenience of the drop-off points is unknown at this time, as with Example 1, so this rate may still not be achievable. There is a risk that this would leave the system operator with a larger surplus than anticipated in this OBC. No recommendation has been made on what this surplus should be used for however given the packaging targets will not be met it could be reinvested in the scheme to drive higher return rates.

6.38. A DRS is partly funded by the value of the material which is collected for recycling. The value of the material is the subject of market forces and may vary. Any change, positive or negative, in funding caused by the varying value of material would be offset by a fee levied on the producer. The risk of there being a funding shortfall due to material prices is low in Example 2 given the overall surplus from the large amounts of unredeemed deposits in this example.

6.39. With any DRS there is the potential for fraud to take place either in underreporting of products put onto the market by producers or the returning of

containers for a deposit refund which has not had the deposit paid on it initially. The fraud measures across all examples in this OBC are consistent in that a specific Scottish label has been assumed necessary. The risk could be considered to be higher in Examples 2 and 4 due to the inclusion of cartons and, in particular, cups given the lack of evidenced experience of including this material from other DRS around the world.

6.40. The material collected through a DRS is of higher quality than material collected through kerbside or similar collection systems currently in place in Scotland. There is however always a risk that end markets will vary their specification for material. Example 2 targets material traditionally targeted by recycling collections as well as cartons and cups. The risk of material collected through this example not being accepted by end processors is low, however for cups and cartons it could be argued that as these are likely to utilise emerging markets the specifications may change. Regardless of this it is anticipated that the quality of cartons and cups collected through a DRS would be superior to that collected via other current methods.

6.41. Time will be required to implement any of the four examples presented in this OBC. The negotiation and installation of dedicated drop-off points, as outlined above, may be significant but the logistics of this example would be still be relatively simple, in comparison, given there are only 2,009 sites. The opposite may be true for Examples 3 and 4. Given this, no determination has been made to differentiate the risk of the timeframe to implement each of these examples.

6.42. Due to the necessity to fund and install additional dedicated drop-off points, recruit a significant number of staff and include cups and cartons in the scope, the commercial risk rating for the system operator under Example 2 is ‘High’.

Example 3 – Take back to any place of purchase

6.43. As described in Examples 1 and 2 all DRS examples will require upfront investment to purchase the necessary infrastructure, staff the implementation and communicate the introduction of the scheme. The infrastructure cost borne by the system operator in Example 3 is the lowest due to the return points being operated by retailers and the scope of containers included being less than that in Example 4 as it does not include HDPE, cartons and cups. The initial capital investment could be funded utilising either a commercial loan or loans from stakeholders involved in the system operation. Given the lower level of initial investment this risk is reduced in comparison to the other examples presented.

6.44. Example 3 requires 17,407 places of purchase to accept containers as part of a DRS. This has the advantage that the system operator does not have to identify sites as in Examples 1 and 2. However the system operator will need to work with retailers to ensure they are fully aware of the requirements, are trained and operational for the commencement of a DRS. This could be a significant undertaking for the operator in advance of the scheme being implemented however it would not

be as onerous as having to set up entirely new sites and so represents a lower overall risk.

6.45. Any DRS being implemented will require a level of procurement. For example, there will be a need for a central IT system, the development of a counting centre, bulking sites and a logistics operation. Given the scope of Example 3 this would provide a more complex procurement exercise as its scale is more inclusive than other examples, particularly given the logistics required to serve the larger number of return points. It is not anticipated that the procurement would take more time however the scope of the counting centre would be greater given it is assumed that 80% of those in scope are returned to the system. There is however a risk that the design and build of any infrastructure required to operate the scheme may impact on the timescale for introducing a DRS.

6.46. All the examples require an element of set up prior to the implementation of a DRS in Scotland. For each example a database will need to be established of all the drinks sold in Scotland which the system operator will be responsible for maintaining and will work with producers to build. It is this database that will confirm that a container being returned is in the scope of the scheme and the deposit should be refunded. This database therefore needs to be available to all machines accepting containers prior to the implementation of the scheme. Any risk associated with the development of such a database is consistent across Examples 1 and 3 and 2 and 4 given the scope of containers in each is the same. Examples 1 and 3 would be simpler given they are assumed to not include HDPE, cartons and cups. Example 3 will also require a database of retailers participating to develop and maintain the logistics operation as all sites are operated externally to the system operator. A regular and reliable logistics operation is imperative to the functioning of the system as well as establishing and maintaining a positive relationship with retailers.

6.47. The system operator will require to recruit staff to operate the DRS across all the examples. Example 3 requires the fewest staff overall as there is no requirement to operate the return points as in Examples 1 and 2. Therefore the risk for the operator in both recruiting staff and maintaining their employment versus Examples 1 and 2, in which the points will be operated by internal staff, is drastically reduced.

6.48. In all schemes there is a risk that the assumed return rate is not achieved by the scheme. Example 3 has an assumed performance of a return rate of 80%. Where the scheme is not achieving the anticipated return rate it could be expected that any additional funds available from the increase in unredeemed deposits should be reinvested into communications to support improvements in the scheme. If the scheme was to exceed its assumed performance and therefore cause a shortfall in funding the producer fee could be increased to cover any additional expense.

6.49. A DRS is partly funded by the value of the material which is collected for recycling. The value of the material is the subject of market forces and may vary. Any change, positive or negative, in funding caused by the varying value of material

would be offset by a fee levied on the producer. This fee is variable to account for fluctuations in the return rate and value of the material.

6.50. With any DRS there is the potential for fraud to take place either in underreporting of products put onto the market by producers or the returning of containers for a deposit refund which has not had the deposit paid on it initially. The fraud measures across all examples in this OBC are consistent in that a specific Scottish label has been assumed necessary for all.

6.51. The material collected through a DRS is of higher quality than material collected through kerbside or similar collection systems currently in place in Scotland. There is however always a risk that end markets will vary their specifications for material. Example 3 targets material traditionally targeted by existing recycling collections. The risk of material collected through this example not being accepted by end processors is low.

6.52. Time will be required to implement any of the four examples presented in this OBC. For Examples 1 and 2 this requires sites to be set up specifically by the system operator and in Examples 3 and 4 retailers need to install the necessary infrastructure and the system operator needs to provide a reliable logistics operation to 17,407 sites. As outlined in Examples 1 and 2 no determination has been made to differentiate the risk of the timeframe to implement each of these examples.

6.53. As Example 3 does not require the system operator to arrange dedicated sites to act as return points and the scope of the scheme is not as wide as in Examples 2 and 4 this example has been given a commercial risk rating of 'Medium'.

Example 4 – Take back to any place of purchase (with cartons and cups)

6.54. As described in the previous examples all will require upfront investment to purchase the necessary infrastructure, staff the implementation and communicate the introduction of the scheme. The infrastructure cost borne by the system operator in Example 4 is the 2nd lowest due to the return points being operated by retailers but the scope of containers included being greater than that in Example 3 as it includes HDPE, cartons and cups. This means the counting centre needs to be larger. The initial capital investment could be funded utilising either a commercial loan or loans from stakeholders involved in the system operation. Given the lower level of initial investment this risk is reduced in comparison to the Examples 1 and 2.

6.55. Example 4, as with Example 3, requires 17,407 places of purchase to accept containers as part of a DRS. This has the advantage that the system operator does not have to identify sites as in Examples 1 and 2. However the system operator will need to work with retailers to ensure they are fully aware of the requirements, are trained and operational for the commencement of a DRS which includes additional containers to Example 3. This could be a significant undertaking for the operator in advance of the scheme being implemented however it would not be as onerous as having to set up entirely new sites as in Examples 1 and 2 and so represents a lower overall risk.

6.56. Any DRS being implemented will require a level of procurement. For example, there will be a need for a central IT system, the development of a counting centre, bulking sites and a logistics operation. Given the scope of Example 4 this would provide a more complex procurement exercise as its scale is the most inclusive of the examples, particularly given the logistics required to serve the larger number of return points for a larger number of containers. It is not anticipated that the procurement would take more time however the scope of the counting centre and logistics would be greater given it is assumed that 80% of those containers in scope are returned to the system. There is however a risk that the design and build of any infrastructure required to operate the scheme may impact on the timescale for introducing a DRS.

6.57. All the examples require an element of set up prior to the implementation of a DRS in Scotland. For each example a database will need to be established of all the drinks sold in Scotland which the system operator will be responsible for maintaining and will work with producers to build. It is this database that will confirm that a container being returned is in the scope of the scheme and a deposit should be refunded. This database therefore needs to be available to all machines accepting containers prior to the implementation of the scheme. Any risk associated with the development of such a database is consistent across Examples 1 and 3 and 2 and 4 given the scope of containers in each is the same. Examples 2 and 4 would be more complex and resource intensive given they are assumed to include HDPE, cartons and cups. Example 4, as with Example 3 will also require a database of retailers participating to develop and maintain the logistics operation as all sites are operated externally to the system operator. A regular and reliable logistics operation is imperative to the functioning of the system as well as establishing and maintaining a positive relationship with retailers.

6.58. The system operator will require to recruit staff to operate the DRS across all the examples. Example 4 requires the 2nd lowest staff overall as there is no requirement to manage the return points as in Examples 1 and 2. Therefore the risk for the operator in both recruiting staff and maintaining their employment versus Examples 1 and 2 in which the points will be operated by internal staff is drastically reduced.

6.59. In all schemes there is a risk that the assumed return rate is not achieved by the scheme. Example 4 has an assumed performance of a return rate of 80%. Where the scheme is not achieving the anticipated return rate it could be expected that any additional funds available from the increase in unredeemed deposits should be reinvested into communications to support improvements in the scheme. If the scheme was to exceed its assumed performance and therefore cause a shortfall in funding the producer fee could be increased to cover any additional expense.

6.60. A DRS is partly funded by the value of the material which is collected for recycling. The value of the material is the subject of market forces and may vary. Any change, positive or negative, in funding caused by the varying value of material

would be offset by a fee levied on the producer. This fee is variable to account for fluctuations in the return rate and value of the material.

6.61. With any DRS there is the potential for fraud to take place either in underreporting of products put onto the market by producers or the returning of containers for a deposit refund which has not had the deposit paid on it. The fraud measures across all examples in this OBC are consistent in that a specific Scottish label has been assumed necessary. The risk could be considered to be higher in Examples 2 and 4 due to the inclusion of cartons and, in particular, cups given the lack of evidenced experience of including this material from other DRS around the world.

6.62. The material collected through a DRS is of higher quality than material collected through kerbside or similar collection systems currently in place in Scotland. There is however always a risk that end markets will vary their specification for material. Example 4 targets material traditionally targeted by recycling collections in addition to cartons and cups. The risk of material collected through this example not being accepted by end processors is low however for cups and cartons it could be argued that as these are likely to utilise emerging markets the acceptance criteria may change. Regardless of this it is anticipated that the quality of cartons and cups collected through a DRS would be superior to that collected via other methods.

6.63. Time will be required to implement any of the four examples presented in this OBC. For Examples 1 and 2 this requires sites to be set up specifically by the system operator and in Examples 3 and 4 retailers need to install the necessary infrastructure and the system operator needs to provide a reliable logistics operation to 17,407 sites. As outlined in the previous examples no determination has been made to differentiate the risk of the timeframe to implement each of these examples.

6.64. As Example 4 does not require the system operator to arrange dedicated sites to act as return points but the scope of the scheme has been extended to include cartons and cups this example has been given a commercial risk rating of ‘Medium-High’.

7. The management case

7.1 Introduction

7.0. The project to design and implement a deposit return scheme is part of a wider extended producer responsibility (EPR) programme and is managed in accordance with the principles of Managing Successful Programmes and PRINCE2 project management. The aim of the project is to manage the process required to lead to the introduce of a DRS for single use drinks containers in Scotland.

7.2 Background

7.1. The overall scope of the project is to:

- Research and evaluate the examples using the Five Case model (Phase 1).
- Carry out a Public Consultation and take decisions on the nature of the DRS to be implemented, and introduce any necessary Regulations and Legislation to be adopted by the Scottish Parliament (Phase 2).
- Implement the DRS (Phase 3).

7.2. With the publication of the consultation and Outline Business Case, Business Regulatory Impact Assessment, Equality Impact Assessment and Strategic Environmental Assessment, Phase 1 has been completed and Phase 2 has been commenced.

7.3. Phase 2 includes the consultation, review of responses, decisions on the nature of the scheme to be implemented, development of a Full Business Case and any required regulation and/or legislation. This will lead onto Phase 3, the implementation of a deposit return scheme for Scotland. Continued stakeholder engagement will also continue throughout Phase 2 and Phase 3.

7.3 Organisational structure

7.4. A Programme Board has been established and is responsible for setting the strategic direction of the deposit return scheme programme, determining the scope of work, and taking decisions on strategic policy as well as monitoring any identified risks. Members of the Programme Board include representatives from Scottish Government (the Board is chaired by the Director of Environment and Forestry), Zero Waste Scotland, Scottish Environment Protection Agency and Highlands & Islands Enterprise.

7.5. A Programme Management Group has been established and includes representatives from Scottish Government, Zero Waste Scotland and Scottish Environment Protection Agency. This group is responsible for overseeing operational

delivery of the deposit return scheme, providing technical input, resource capacity, and approving submissions to the Board.

7.6. A Technical Group also exists to co-ordinate activity within Zero Waste Scotland, joining up activity on modelling, data analysis, equalities impacts, business impacts, environmental impacts, stakeholder engagement, policy development, evaluation and procurement.

7.4 Methodologies

7.7. The project is managed in accordance with PRINCE2 principles by a designated Programme Manager. The Quality Management Strategy ensures that Programme Board papers and reports are evidence based, citing published sources whenever available. Papers and reports for the board are subject to review by the Programme Management Group in addition to independent peer review as necessary.

7.8. These activities are supported by the Chair of the Programme Management Group, a member of Zero Waste Scotland's Executive Leadership Team, and a dedicated Programme Manager who, utilising PRINCE2 methodologies, co-ordinates activities between the different organisations involved.

SECTION D: NEXT STEPS

8. Next steps

8.0. This section summarises the process necessary to develop the examples and the necessary next steps to move towards a DRS for Scotland. The public consultation is an opportunity for anyone interested to help shape the final design for the scheme.

8.1. The work to reach this point has been done in consultation with stakeholders and we are committed to continuing this dialogue. The consultation responses will be published and a report analysing the responses will be commissioned and published on the Scottish Government website when completed.

8.2. The Scottish Government and Zero Waste Scotland will work together to design a final system. There will be a subsequent opportunity to comment on the design that we will bring forward. Once Scottish Ministers are satisfied with the proposed design, it will be taken forward to super affirmative regulations, which will include an additional forty-day pre-laying period for comment.

8.3. The work to design the final system will build upon the work completed by Zero Waste Scotland to date and as noted throughout this document will seek to update the calculations where it has not been possible to quantify costs or benefits for inclusion in this work.

8.1 Update NPV

8.4. Net Present Value figures have been presented in this outline business case for the DRS examples identified. These are for examples which assist to illustrate the possibilities of a DRS in Scotland. These figures have been produced through modelling building upon work undertaken by Zero Waste Scotland. The figures to populate the model have been derived through hundreds of discussions with stakeholders including one to one interviews, strategic conversations, workshops as well as visits to and discussions with existing schemes. In some instances, it has not been possible to obtain a usable figure for particular variables within the model due to commercial sensitivities or unknowns related to system design choices e.g. quantifying producer logistics costs within a DRS. These have been identified within the consultation and where applicable submissions to the consultation may be used to inform an update to the net present value of the examples presented (and indeed any different model resulting from the consultation feedback) for progressing towards a final scheme design. Where necessary this will be included in the full business case when published.

8.2 Final scheme design

8.5. It is possible the final system design taken forward for a DRS will be a hybrid of the examples presented in this outline business case and other scheme design choices. As previously explained our approach to the design of a DRS is to break the system down into 12 components each of which have decisions that will impact upon the final design. Although the components have elements of interdependencies, decisions may be taken independently as informed by stakeholder feedback. Through the consultation the Scottish Government have requested the views on the decisions that should be taken on those components to help to shape the final design of the system.

8.6. The views presented will inform the final design of the scheme.

8.3 Produce full business case

8.7. The final system design will be subject of a full business case which will be produced building upon the outline business case and submissions to the consultation.

8.8. As outlined above the preferred option taken forward may be a hybrid of the examples that have been presented in the Outline Business Case and other design choices as informed by the consultation. In publishing the full business case the analysis from this document will be updated to align it with the decisions on system design which are taken following the consultation. The principles of the economic appraisal will remain consistent with those used to develop this document.

8.9. The Full Business Case will outline how the project will be implemented and how the benefits will be realised. This will include updating the project management strategy, defining how the project will be implemented, how the benefits will be realised, how business and service risks will be mitigated and managed, how the project will be reviewed and what risk management and contingency plans are in place.

ANNEX A

9. Development of the examples

Example 0 – No scheme is introduced

What the example does	Do nothing/status quo.
What the example does not do	Introduce a DRS for Scotland. The Scottish Government has committed to introducing a scheme.
What changes occur to the status quo	Under example 0 there are no changes to the *status quo.*
What the scheme would look like practically	As no scheme would be introduced, existing public and private collection methods for drinks containers from households, commercial businesses and on-the-go locations would continue.

Example 1 – Take back to dedicated drop-off points

What the example does	Introduce a DRS for Scotland. Place a refundable deposit on PET plastic bottles, aluminium and steel cans and glass bottles. Creates a non-profit organisation to co-ordinate delivery of the scheme, overseen by the drinks industry.
What the example does not do	Significantly improve recycling rates for target materials. Require retailers to act as a return location for deposit bearing containers.
What changes occur to the status quo	Target containers would have a 20p refundable deposit placed on them. Series of dedicated drop-off points for DRS containers. Management of material collected by the system operator. National education and awareness of consumers. Regulation of the scheme.
What the scheme would look like practically	Target containers would be taken back by the consumer to a number of large dedicated points. This scheme would see dedicated points being placed in towns of a certain size. Shops selling beverage containers would not have to take containers back. The drinks industry would work together to create a non-profit organisation that would deliver the scheme.


EXAMPLE 1
SCOTLAND'S DEPOSIT RETURN SCHEME
TAKE BACK TO DEDICATED DROP-OFF POINTS
BUY DRINK. PAY DEPOSIT
20p DEPOSIT
TAKE BACK TO A DEDICATED DROP-OFF POINT
AROUND 1000 RETURN POINTS NATIONWIDE
TOWN DEPOSIT RETURN POINT
20p
DEPOSIT RETURNED TO YOU
BOTTLES & CANS RECYCLED
CONTAINERS RECYCLED
PET PLASTIC BOTTLES
GLASS BOTTLES
STEEL/ALUMINIUM CANS
SCHEMES SIMILAR TO THIS ALREADY EXIST IN:
AMERICA
AUSTRALIA
ANTICIPATED RECYCLING RATE:
60%
WHERE
DEDICATED DROP-OFF POINTS WOULD BE LOCATED IN CONVENIENT LOCATIONS IN TOWNS.
This example is one of four deposit return scheme design examples being presented as part of the public consultation on Scotland's deposit return scheme. Following feedback, scheme design components across all four examples may be combined to provide the final scheme design. This will be decided upon by the Scottish Government.
Scottish Government gov.scot
ZERO WASTE SCOTLAND

Example 2 – Take back to dedicated drop-off points and some shops (with cartons and cups)

What the example does	Introduce a DRS for Scotland Place a refundable deposit on PET and HDPE plastic bottles, aluminium and steel cans, glass bottles, beverage cartons and disposable cups. Requires some retailers to act as a return location and accept containers for return, if there is not a dedicated drop-off point located nearby. Create a non-profit organisation to co-ordinate delivery of the scheme, overseen by the drinks industry.
What the example does not do	Significantly improve recycling rates for different materials.
What changes occur to the status quo	Target containers would have a 20p refundable deposit placed on them. Series of dedicated drop-off points for DRS containers, with some shops also acting as return locations. Management of material collected. National education and awareness of consumers. Regulation of the scheme.
What the scheme would look like practically	Dedicated points would be within a set distance to any shop selling a beverage in a disposable container. There would be more return locations than example 1 as some shops who sell high quantities of drinks in disposable containers would be required to act as return locations if there is not a dedicated drop-off point within a set distance. The drinks industry would work together to create a non-profit organisation that would deliver the scheme.


EXAMPLE 2
SCOTLAND'S DEPOSIT RETURN SCHEME
TAKE BACK TO DEDICATED DROP-OFF POINTS AND SOME BIGGER SHOPS
BUY DRINK. PAY DEPOSIT
20p DEPOSIT
TAKE BACK TO DEDICATED DROP-OFF POINT
OR
TAKE BACK TO SOME BIGGER SHOPS
(IF THERE'S NO DROP-OFF POINT WITHIN A SET DISTANCE)
DEPOSITS RETURNED HERE
AROUND 2000 RETURN POINTS NATIONWIDE
SUPERSTORE
20p
DEPOSIT RETURNED TO YOU
BOTTLES, CANS, CARTONS & CUPS RECYCLED
CONTAINERS RECYCLED
PET PLASTIC BOTTLES
HDPE PLASTIC BOTTLES
GLASS BOTTLES
CARTONS
SOME CUPS
STEEL/ALUMINIUM CANS
SCHEMES SIMILAR TO THIS ALREADY EXIST IN:
CALIFORNIA, USA
MAINE, USA
BRITISH COLUMBIA, CANADA
ANTICIPATED RECYCLING RATE:
70%
WHERE
DEDICATED DROP-OFF POINTS IN TOWNS. IF THERE IS NOT ONE WITHIN A SET DISTANCE, CERTAIN PLACES THAT SELL DRINKS WOULD ALSO RETURN DEPOSITS
SUPERSTORE
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Example 3 – Take back to any place of purchase

What the example does	Introduce a DRS for Scotland Place a refundable deposit on PET plastic bottles, aluminium and steel cans and glass bottles Requires retailers to act as a return location and accept containers for return. Create a non-profit organisation to co-ordinate delivery of the scheme, overseen by the drinks industry.
What the example does not do	Have the wide coverage of materials that examples 2 and 4 have.
What changes occur to the status quo	Target containers would have a 10p refundable deposit placed on them. Retailers accept deposit bearing containers back from the consumer in exchange for the deposit. Management of material collected. National education and awareness of consumers. Regulation of the scheme.
What the scheme would look like practically	Any retailer that sells a beverage in a disposable beverage container would be required to provide a deposit return service. Consumers would be able to take containers to any place of purchase to receive their deposit back. There would be more return locations than examples 1 and 2. There would likely be a combination of automatic and manual return methods. The drinks industry would work together to create a non-profit organisation that would deliver the scheme.


EXAMPLE 3
SCOTLAND'S DEPOSIT RETURN SCHEME
TAKE BACK TO ANY PLACE OF PURCHASE
BUY DRINK. PAY DEPOSIT
10p DEPOSIT
TAKE BACK TO ANY PLACE THAT SELLS DRINKS*
*TAKE BACK CAN BE BY MACHINE OR AT COUNTER
DEPOSITS RETURNED HERE
LOCAL SHOP
AROUND 17,000 RETURN POINTS NATIONWIDE
10p
DEPOSIT RETURNED TO YOU
BOTTLES & CANS RECYCLED
CONTAINERS RECYCLED
PET PLASTIC BOTTLES
GLASS BOTTLES
STEEL/ALUMINIUM CANS
SCHEMES SIMILAR TO THIS ALREADY EXIST IN:
SCANDINAVIA
BALTIC STATES
ANTICIPATED RECYCLING RATE:
80%
WHERE
ANY PLACE THAT SELLS DRINKS
DEPOSITS RETURNED HERE
LOCAL SHOP
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Example 4 – Take back to any place of purchase (with cartons and cups)

What the example does	Introduce a DRS for Scotland Place a refundable deposit on PET and HDPE plastic bottles, aluminium and steel cans, glass bottles, beverage cartons and disposable cups. Requires retailers to act as a return location and accept containers for return. Create a non-profit organisation to co-ordinate delivery of the scheme, jointly overseen by industry and a public body.
What the example does not do	
What changes occur to the status quo	Target containers would have a 10p refundable deposit placed on them Retailers accepting deposit bearing containers back from the consumer in exchange for the deposit. Management of material collected. National education and awareness of consumers. Regulation of the scheme.
What the scheme would look like practically	Any retailer that sells a beverage in a disposable beverage container would be required to provide a deposit return service. Consumers would be able to take containers to any place of purchase to receive their deposit back. There would be more return locations than examples 1 and 2. There would likely be a combination of automatic and manual return methods. The drinks industry would work together with the public sector to create a non-profit organisation that would deliver the scheme.


EXAMPLE 4
SCOTLAND'S DEPOSIT RETURN SCHEME
TAKE BACK TO ANY PLACE OF PURCHASE
(WITH CARTONS AND CUPS)
BUY DRINK. PAY DEPOSIT
10p
DEPOSIT
TAKE BACK TO ANY PLACE THAT SELLS DRINKS*
*TAKE BACK CAN BE BY MACHINE OR AT COUNTER
DEPOSITS RETURNED HERE
LOCAL SHOP
AROUND 17,000 RETURN POINTS NATIONWIDE
10p
DEPOSIT RETURNED TO YOU
BOTTLES & CANS RECYCLED
CONTAINERS RECYCLED
PET PLASTIC BOTTLES
HDPE PLASTIC BOTTLES
GLASS BOTTLES
CARTONS
SOME CUPS
STEEL/ALUMINIUM CANS
SCHEMES SIMILAR TO THIS ALREADY EXIST IN:
THE CLOSEST SCHEMES TO THIS EXIST IN SCANDINAVIA AND THE BALTIC STATES, BUT DON'T COLLECT CARTONS OR CUPS. THIS WOULD BE UNIQUE TO SCOTLAND
ANTICIPATED RECYCLING RATE:
80%
WHERE
ANY PLACE THAT SELLS DRINKS
DEPOSITS RETURNED HERE
LOCAL SHOP
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