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Scottish Packaging Recovery Note

Feasibility Study

Zero Waste Scotland

May 2015

Andrew McCaffery, Gordon Francey, Colette Fox and Heather Thomson

valpak

Executive Summary

Project Scope

This project was commissioned by Zero Waste Scotland in order to assess the feasibility of a Scottish Packaging Recovery Note (SPRN).

Scottish Packaging Flow

For a SPRN to be comparable to the current systems a baseline data of packaging material going on to and collected from the Scottish market was required to be estimated. The information for this assessment came for public sources and Valpak's private dataset.

It is estimated that the total quantity of packaging placed on to the Scottish market is 944k tonnes, with 534k tonnes collected for recycling. This gives a Scottish recycling rate, for packaging material, of 57%. This is compared to the current UK recycling rate of 56%. However some of the key materials, glass, steel and aluminium were below the UK recycling rates and the EU packaging target.

Proposed Scottish PRN System

The proposed Scottish PRN model was developed through a series of stakeholder workshops. In order to address some of the criticisms of the current UK system, and provide an audit trial to ensure that the material has been collected in Scotland, the SPRN model differs from the current UK PRN system in the following areas:

- An evidence point at the collection. Collectors would be required to provide evidence to compliance schemes on the quality and quantity of the packaging material they have collected. In return for the production of this evidence they would receive a share of the overall SPRN value.
- The introduction of a compliance SPRN which would ensure that no compliance scheme or direct registrant can fail due lack of collection of packaging material.
- A litter fee that is based on the unobligated packaging placed on the market.

The proposed model also allows for amendments to include targets to reduce the environmental impact and individual polymer targets.

Regulatory Impact Assessment (RIA)

A Regulatory Impact Assessment was undertaken for the SPRN together with two other options which were a baseline option of continuing with the current system and an option of reporting of Scottish specific data. The RIA was assessed over a period of 2015 to 2020 and 2015 to 2030. The total net present value results of the RIA are:

	2015 – 2020	2015 - 2030

Option 1 – Current System	£0	£0
Option 2 – SPRN System	-£1.3M	£14M
Option 3 – Scottish Reporting	-£41M	-£98M
Option 4 – Voluntary Participation	£8M	£39M

Conclusions

It is feasible to introduce a SPRN system adapted from the existing UK PRN, although the benefits would only outweigh the costs over a 15 year period. If the SPRN system was completely separate from the UK system and obligation was removed from the UK system this would require a change in primary legislation which would potentially delay the implementation of the system.

As can be seen from the results of the RIA the best available option from a social, environmental and economic perspective is to adopt Scottish reporting with a voluntary participation option, the voluntary participation would include setting Scottish specific targets and voluntarily extending the scope of Consumer Information Obligations to include responsibility for litter and a litter fee based system. However this is based on the assumption that it would deliver the increased recycling rates achieved through a full implementation of the proposed system.

To achieve UK recycling levels, and the potential higher targets being set by the European Union, other formats of packaging will be required to be targeted in addition to beverage containers. Currently, collection levels of Pots, Tubs and Trays are very low and these formats need to be included as specific targets in any compliance system.

The principles of the SPRN system, or a Scottish reporting and voluntary system, can be extended to include further material streams, in particular other packaging formats or materials that are present within the consumer stream, have low residual value and are disposed of currently to landfill. In particular items like non-clothing textiles, footwear, mattresses and carpets.

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1. Project Scope

1.1 Introduction

This project has been commissioned by Zero Waste Scotland in order to explore alternatives to the UK producer responsibility system for packaging waste. Producer responsibility along with other waste legislation is a devolved responsibility for Scottish Government. Zero Waste Scotland on behalf of Scottish Government have commissioned three streams of work assessing the feasibility of different compliance regimes. The streams are Compulsory Deposits, Scottish Packaging Recovery Note (SPRN) and a third stream on a voluntary system.

This project will assess the feasibility of a SPRN. In addition to assessing the feasibility of the system in achieving UK and European packaging recycling rates, it will also assess the suitability of the system to reduce the quantity of litter being generated throughout Scotland.

The UK PRN (packaging Recovery Note) system for packaging compliance is a form of environmental tradable permit which was introduced in the UK in 1997 as part of The Producer Responsibility Obligations (Packaging Waste) Regulations 1997, transposed from the European Directive (The Packaging and Packaging Waste Directive (94/62/EC)). The current PRN system is UK wide and places obligations on all companies (above £2m turnover and 50 tonnes packaging handled) involved in the supply of packaging around products placed onto the UK market. Annual targets are set for various packaging material streams and the obligations are shared across the supply chain.

The current system is not directly designed to reduce the quantity of litter generated; however it does place a requirement through Consumer Information Obligations (CIOs) for sellers to provide consumers with information on how to recycle packaging, the consumer's role in recycling and the meaning of recycling labels. The project will assess the feasibility of extending this obligation to cover litter education.

1.2 Project Objectives

The main objectives of the project are:

- Establish a baseline flow of packaging material, by material type and format, on to and off the Scottish market
- Assess the main amendments that would be required to achieve a SPRN system that operates only within Scotland
- Assess the impact on local authorities (LAs) and other private collectors that are currently collecting packaging material
- Provide a clear impact assessment on the proposed changes, taking account of social, environmental and economic factors
- Highlight implications to Scottish Government in implementing any recommendations
- Provide a cost and timeline for any implementation
- Assess the feasibility of the SPRN system being extended to cover other waste streams, for example textiles

1.3 Method Statement

The method employed to achieve the stated objectives of the project was split into four phases. Each phase ran consecutively with the results from the proceeding phase(s) used in the analysis. A summary of the four phases is outlined below:

- Phase 1 – Establishing the baseline figures for Scotland
- Phase 2 – System design and stakeholder engagement
- Phase 3 – Regulatory impact assessment
- Phase 4 – Implementation plan and report

In the initial phase of the project the quantity and the composition of packaging material being placed on the Scottish market was established. The headline material figures were broken down by material type, format, consumer and non-consumer markets. The onto the market figures were calculated using a variety of sources including industry sources, retail sales figures and Valpak's Environmental Product Information Centre (EPIC) database, which includes details of over 3 million packaged products sold in the UK.

Recycling rates for Scotland were assessed using the National Waste Packaging Database (NWPD), Waste Data Flow and RECOUP LA survey data. The only available figures for the project team were for 2012 collection rates therefore this has been used as the baseline year.

In Phase two of the project an initial SPRN model was developed. The initial model was developed by the project team based on secondary research of producer responsibility schemes in Europe and North America. This model was then taken to a stakeholder workshop which included representatives of retailers, brand owners, local authorities, compliance schemes, trade associations, reprocessors and regulators. During the workshop the model was discussed against the following parameters:

- Ability to implement the system
- Quantity of material being placed in the wrong location
- Potential for fraud through cross-border flow of material
- The economic development of a circular economy within Scotland
- Ability to achieve European packaging recycling targets
- Ability for the system to expand into other producer responsibility areas
- Carbon impact of the system
- Administrative burden and cost to producers, local authorities, reprocessors, exporters and enforcement authorities

Following the workshop the model was refined based on stakeholder feedback.

In phase three a Regulatory Impact Assessment (RIA) was undertaken of the proposed model with the current system used as a base level for the calculation. The regulatory impact assessment assessed four models, these were:

- Current System (baseline)
- SPRN

- Current system, but with additional reporting of Scottish sales data
- Reporting of Scottish sales data with an additional voluntary agreement on targets and a litter fund

All four options were assessed for their costs and benefits in relationship to social, environmental and economic factors.

The final phase of the project was the development of an implementation plan with a timeline. The implementation plan assessed the need for any change of legislation to encompass the proposed system and the suitability to extend the model to other waste streams. A second stakeholder workshop was also held, to present the key elements of the proposed system as per the final report.

2. Scottish Packaging Flow

2.1 Introduction

In order to have a robust data set of packaging going on to the Scottish market, secondary research and data analysis was undertaken. Various methodologies were used to estimate different sets of data; specifically the data sets required were quantities of Scottish packaging sold and recycled. These were broken down into material type and format and the streams of consumer, non-consumer and total. Each stream included the following information:

- The quantity from the sector flowing onto the Scottish market
- The quantity of packaging collected in Scotland for recycling, by material, from each stream
- The total percentage of Scottish packaging recycled by material type from each stream
- The proportion of UK packaging flow arising in Scotland from each stream
- The proportion of UK packaging recycled from packaging collected in Scotland from each stream

A full data table illustrating the above estimates and the equivalent UK estimates can be found in Appendix I. The three sections below provide a summary of the findings along with an outline of the methodologies adopted and assumptions made.

2.2 Data Uncertainty

The data used in this report to estimate Scottish packaging consumption have been appropriately referenced throughout and cross checked with alternative sources where available. Potential uncertainties around estimates are acknowledged, particularly concerning the proportioning of Scottish packaging from UK packaging, which is based on the ratios of Scottish:UK population (consumer packaging consumption) and Scottish:UK businesses (non-consumer packaging consumption). All data used in this report was deemed reliable from stakeholder groups, robust and the best available, accordingly the estimates of Scottish packaging are as accurate and robust as possible notwithstanding the data limitations.

2.3 Packaging Placed on the Scottish Market (by material)

Currently obligated companies do not generally separate out their Scottish sales and packaging supply for reporting; therefore it was necessary to estimate the quantities of different types arising in Scotland.

2.3.1 Consumer Packaging

Consumer arisings have been estimated based on UK consumer sales, due to the lack of availability of Scottish specific sales data. The methodology assumes that the proportions of supermarket packaging materials and formats are a suitable proxy for all retail sales and that a UK packaging sales breakdown is a suitable proxy for a Scottish packaging sales breakdown. This process involves scaling up Valpak's grocery market share (57%) to cover all grocery and other retail sales. In order to estimate the proportion of consumer packaging arising in Scotland, a percentage equivalent to that

of Scotland's proportion of the UK population was used (8.3%)[1]. Valpak's EPIC database[2], which contains extensive data on packaging sold around products by retailers in the UK, was combined with retail sales figures in order to estimate consumer packaging arisings by material and format type. The volume of wood packaging being place onto the consumer market is negligible and reported as zero in the table.

Figure 1 below presents both the flow of packaging onto the UK and Scottish markets.

		UK CONSUMER FLOW (t)	SCOTLAND CONSUMER FLOW (t)	
CONSUMER	*Method:*	*[EPIC[1] Data Scaled up to Represent UK Flow]*	*[8.3% of UK Consumer Flow]*	*[% UK Flow that is Scottish*]*
	Aluminium	101k	8k	8.3%
	Paper & Card	1043k	87k	8.3%
	Glass*	1798k	179k	10.0%
	Plastics	1768k	147k	8.3%
	Steel	286k	24k	8.3%
	Wood	0k	0k	8.3%
	TOTAL	4997k	446k	8.9%

**UK and Scottish glass flow figures taken from Valpak and WRAP's GlassFlow [4] report*

Figure 1 Consumer packaging flows on to the UK and Scottish Markets (2012)

2.3.2 Non-Consumer Packaging

Non-consumer arisings covers all material placed on the market by industry in a business to business transaction. The non-consumer arisings also covers products that were purchased and consumed away from home. Non-consumer arisings have been based on UK non-consumer packaging consumption. This was done by adopting PackFlow 2017[3]'s UK flow on to the market data by material type for 2012, with the exception of glass, for which more recent figures were used following the publication of Valpak and WRAP's GlassFlow[4] report. In order to estimate the proportion of non-consumer packaging arising in Scotland, a percentage representing Scotland's proportion of UK businesses was used (8.7%)[5]. The methodology and results are illustrated in Figure 2.

[1] http://www.ons.gov.uk/ons/dcp171778_320900.pdf

[2] Valpak's EPIC (Environmental Product Information Centre) database contains information on over 3,000,000 packaging items, including packaging weights and formats, and in the case of plastic packaging, polymer types

[3] http://www.valpak.co.uk/docs/default-source/environmental-consulting/packflow_2017.pdf?sfvrsn=0

[4] http://www.valpak.co.uk/docs/default-source/environmental-consulting/glassflow-final-report.pdf?sfvrsn=4

[5] Three options were considered for proportioning Scottish businesses and an average of the three options (8.7%) was used in this study to represent the proportion of Scottish businesses of UK businesses: Number of Businesses (7.6%), Number of Businesses per Sector and by Size (11.2%), and Number of Businesses per Sector and by waste type - only accounting for wastes that would include packaging (7.5%).The three options are those presented by the Office of National Statistics: http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-254601

NON-CONSUMER	UK NON-CONSUMER FLOW (t)		SCOTLAND NON-CONSUMER FLOW (t)	
	Method:	*[UK Total Flow (PackFlow Ave) - UK Consumer Flow (EPIC Scaled up)]*	*[8.7% of UK non-consumer Flow]*	*[% UK Flow that is Scottish*]*
	Aluminium	49k	4k	8.7%
	Paper & Card	2773k	243k	8.7%
	Glass*	601k	50k	8.3%
	Plastics	819k	72k	8.7%
	Steel	362k	32k	8.7%
	Wood	1119k	98k	8.7%
	TOTAL	5723k	498k	8.7%

**UK and Scottish glass flow figures taken from Valpak and WRAP's GlassFlow [4] report*

Figure 2 Non-consumer packaging flows on to the UK and Scottish Markets (2012)

2.3.3 Total Packaging onto the Scottish Market

Figure 3 below illustrates the total quantities of packaging materials arising in Scotland, broken down by consumer and non-consumer arisings.

The split between consumer and non-consumer arisings varies for each material; glass, plastics and aluminium all have a majority arising in the consumer stream and are used predominantly to package food and drink products. Wood, steel and paper & card are the remaining three materials that have majority of their volume placed onto the non-consumer market. For paper and card this is due to the quantity of boxes used to transport goods around the country and for steel this is due to the quantity of drums and kegs outweighing consumer packaging such as steel food and drinks cans, however cans are still the dominant format for all of metals.

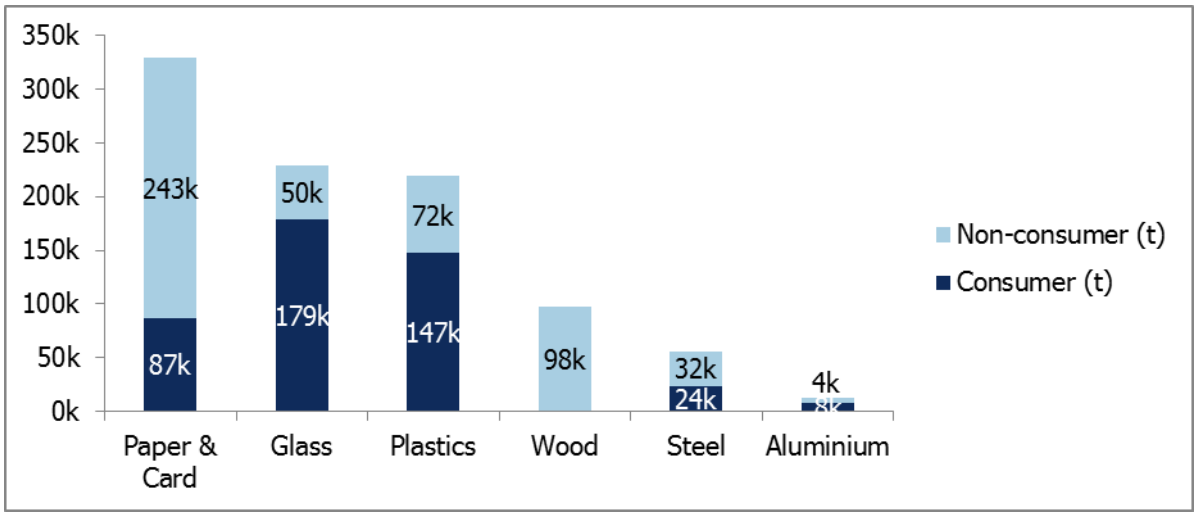

Figure 3 Packaging on to Scottish market, split by consumer and non-consumer streams (2012)

2.3.4 Key Types of Packaging in Scotland

Data extracted from EPIC for the PackFlow[3] projects has enabled some analysis on the key types of packaging arising in the UK and Scotland. From the analysis of the EPIC database the following format types are the dominant formats in each of their respective material streams: cardboard boxes, glass bottles, plastic film, bottles & Pots, Tubs and Trays (PTTs), and metal cans. The figure below summaries the total quantity of the dominant packaging formats and what they represent as proportions of their material stream and overall packaging on to the market.

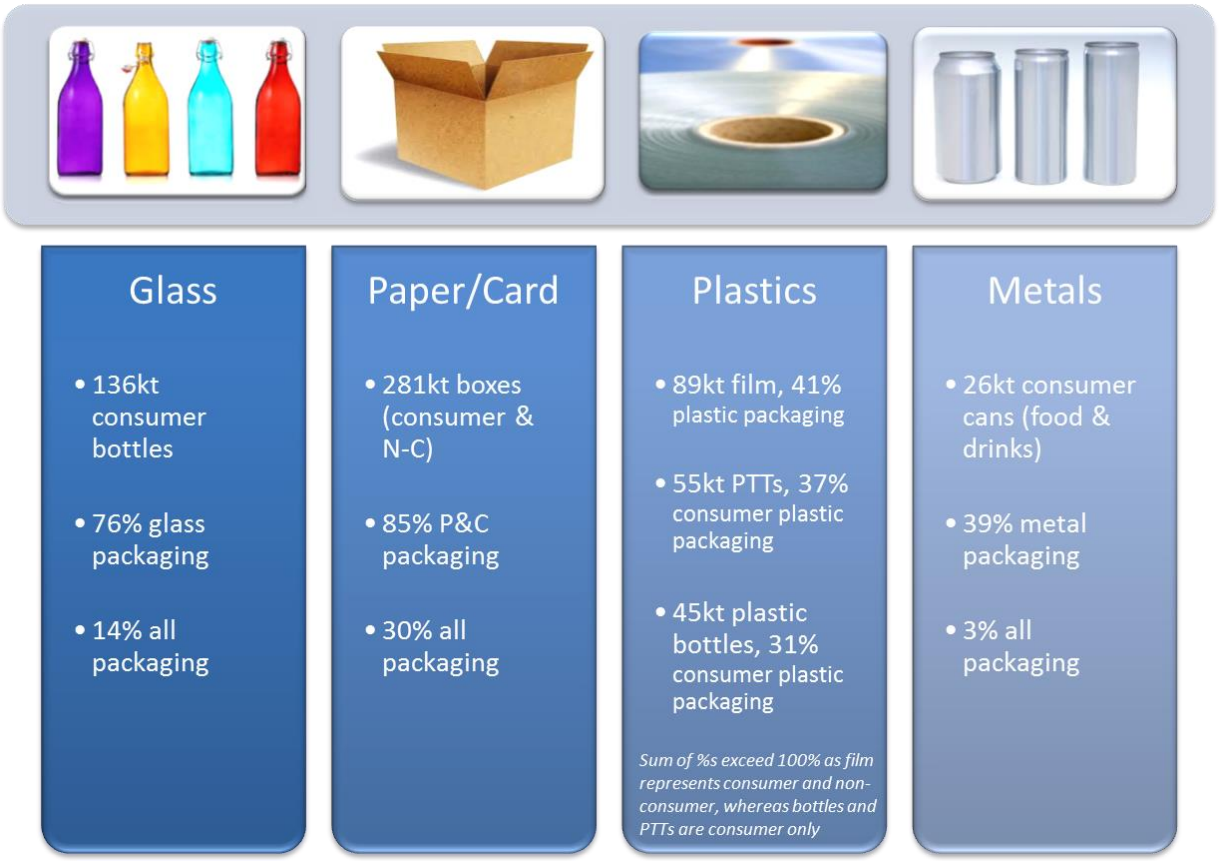

Figure 4 Key packaging types found in Scotland (2012)

2.4 Recycling of Packaging Collected in Scotland (by material)

Most reprocessors in the UK will take in materials collected from all over the UK. Material will often be combined at bulking points and sold on to a UK based reprocessor or exported by a third party; therefore it is difficult and costly to establish an audit trail of exactly where material arose. For this reason, quantities of packaging materials recycled that were collected in Scotland were required to be estimated.

Three sets of recycling figures have been calculated for each packaging material: consumer, non-consumer and total.

2.4.1 Consumer Recycling

Consumer recycling levels (kt) and rates (%) have been estimated from Scottish local authority entries in Waste Data Flow (WDF)[6], with the exception of consumer plastic recycling levels which have been adopted from the more detailed survey work undertaken by RECOUP in their UK Households Plastics Collection Survey 2013[7]. Assumptions made in these calculations include the various splits of materials found in co-mingled, mixed cans and mixed plastics collections[6]. It is important to note that the WDF figures are reported based on the financial year (for the UK and calendar for Scotland) and the latest figures available were for 2012/13. This means there is some degree of inconsistency between the collection figures that cover the period April 2012 through to March 2013 and the consumption figures that cover the period January 2012 through to December 2012. There are also questions around the accuracy of WDF data, with reported collection figures often presumed higher than actual reprocessing figures (which exclude contamination).

Figure 5 below summarises the quantities of materials recycled and their associated recycling rates. As can be seen Scottish consumer recycling rates vary from 23% for plastic packaging (predominantly plastic bottles) to 75% for paper & card packaging (predominantly cardboard boxes). For a comparison of UK and Scottish consumer recycling levels/rates, by material, please see Appendix I.

		SCOTLAND CONSUMER FLOW (t)	RECYCLED PACKAGING COLLECTED IN SCOTLAND (t)	
CONSUMER	*Method:*	*[8.3% of UK Consumer Flow]*	*[Scottish LAs WDF Data]*	*[Scottish Consumer Recycling Rate]*
	Aluminium	8k	4k	44%
	Paper & Card	87k	65k	75%
	Glass	179k	99k	55%
	Plastics*	147k	34k	23%
	Steel	24k	13k	54%
	Wood	0k	0k	N/A
	TOTAL	446k	215k	48%

** UK & Scottish plastics recycling figures provided by Recoup from their LA Plastics Collection Survey work, 2012*

Figure 5 Scottish Consumer Packaging Recycling level/rates, by material (2012)

Overall, there remains an estimated 231kt of consumer packaging remaining in the Scottish residual waste stream. This represents 52% of all consumer packaging waste remaining in the Scottish waste stream.

[6] http://www.wastedataflow.org/ Cleansed and material separated WDF data provided by WRAP. The split of mixed aluminium/steel cans used has been amended to represent proportions identified in separate collections of aluminium and steel cans by Scottish local authorities. i.e. where WRAP have applied a nominal 20/80 aluminium/steel split, Valpak have used a 22/78 split for Scottish Authorities. 22/78 is consistent with alupro Metal Matters figures and WRAP/Valpak internal data from UK MRFs.

[7] http://www.recoup.org/p/131/uk-households-plastics-collection-survey

1.3.1.1 Beverage Containers[8]

Deposit systems are an alternative collection method that potentially could be used to collect some types of beverage containers in Scotland. For this reason it is important to understand:

- The quantity and proportion of implicated drinks packaging arisings
- The quantity and proportion of drinks packaging recycled
- The quantity of packaging material that would be excluded from such a system and require collection in an alternative way.

To calculate beverage container recycling rates, the above analysis on key packaging types in Scotland can be taken a step further and used to better understand the quantity and proportion of beverage containers being purchased by consumers in Scotland. Figure 6 below illustrates the proportions and quantities of the different types of beverage containers bought by consumers in the UK, with glass bottles being by far the most prevalent (by weight), representing 74%.

The quantities of beverage containers have been estimated through interrogation of EPIC data and retail sales data available to Valpak. Combined they provide visibility of the proportion of different packaging types sold in the UK (e.g. glass packaging can be broken down into glass bottles, glass jars, etc). Glass bottles as a category can then be split in to bottles containing alcoholic beverages, soft drinks and 'other' such as sauces, oils and perfumes, for example. UK proportions have been taken as a proxy for Scottish proportions in the absence of Scottish specific retail data. It is understood that some Scottish consumer patterns are different from the UK as a whole but we believe these will not have a significant impact on the analysis.

In all, consumer beverage containers represent an estimated 18% of all packaging in Scotland. If milk bottles were to be excluded from a deposits scheme due to hygiene factors[9] or due to being considered an 'essential item', this would remove 14kt (1.5%) from the total 172kt beverage containers arising in Scotland.

[8] For the purpose of this study beverage containers include glass bottles, plastic bottles, aluminium cans and steel cans

[9] Eunomia (2010) Have We Got the Bottle? Implementing a Deposit Refund Scheme in the UK, A report for the Campaign to Protect Rural England & ERM (2008) Review of Packaging Deposits System for the UK, Final Report produced for Defra.

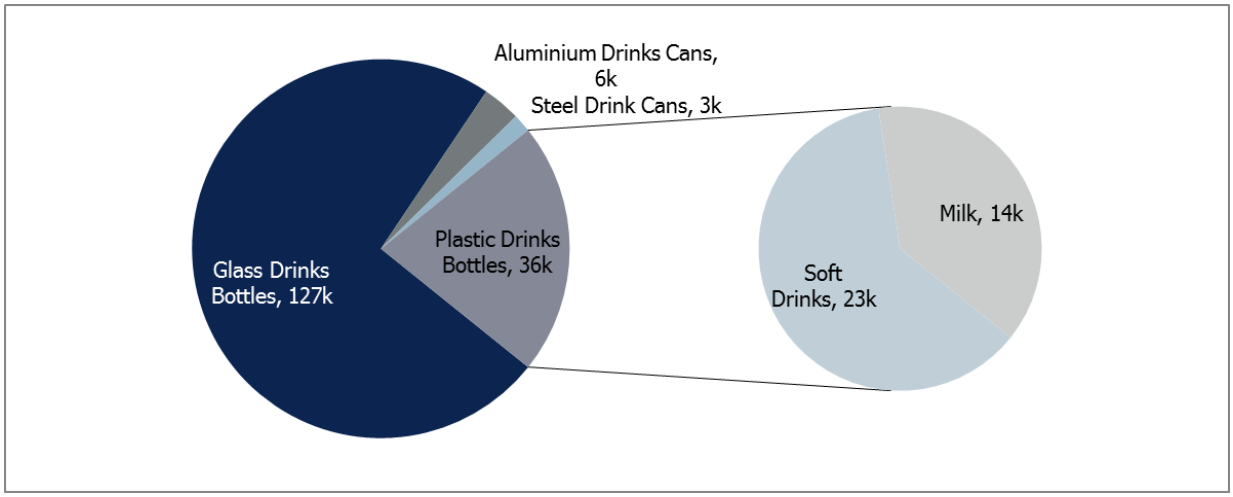

Figure 6 Quantities of beverage containers purchased in Scotland (2012)

Using the estimated quantities of beverage containers purchased in Scotland (Figure 6 above) and adjusting the Scottish packaging consumer recycling rate (Figure 5) for each material to represent only beverage containers in Scotland, it is possible to estimate the current recycling rate for each type of drinks packaging. Specifically identifying the proportion of Scottish beverage containers recycled is challenging, but using (limited) internal Valpak waste composition analysis data, estimations have been made. The assumptions made are as follows:

- 75% of plastic bottles recycled are drinks bottles (by weight)
- 93% of all aluminium cans recycled are drinks cans (by weight)
- 14% of all steel cans recycled are drinks cans (by weight)
- 90% of all glass bottles recycled are drinks bottles (by weight)[10]

Using the above mentioned estimated flow and recycling levels, beverage container recycling rates have been calculated and are illustrated in Figure 7. As can be seen at least 52% of beverage containers in each material stream are currently being recycled and in the case of glass drinks bottles the recycling rate is as high as 70%.

[10] No data on the proportion of 'other' types of glass bottles (sauce, oil, perfume, etc) recycled was available. The ratio on to the market is approximately 93% drinks bottles to 7% other formats by weight. Assumption of the bottles recycled a disproportionately of drinks bottles are recycled.

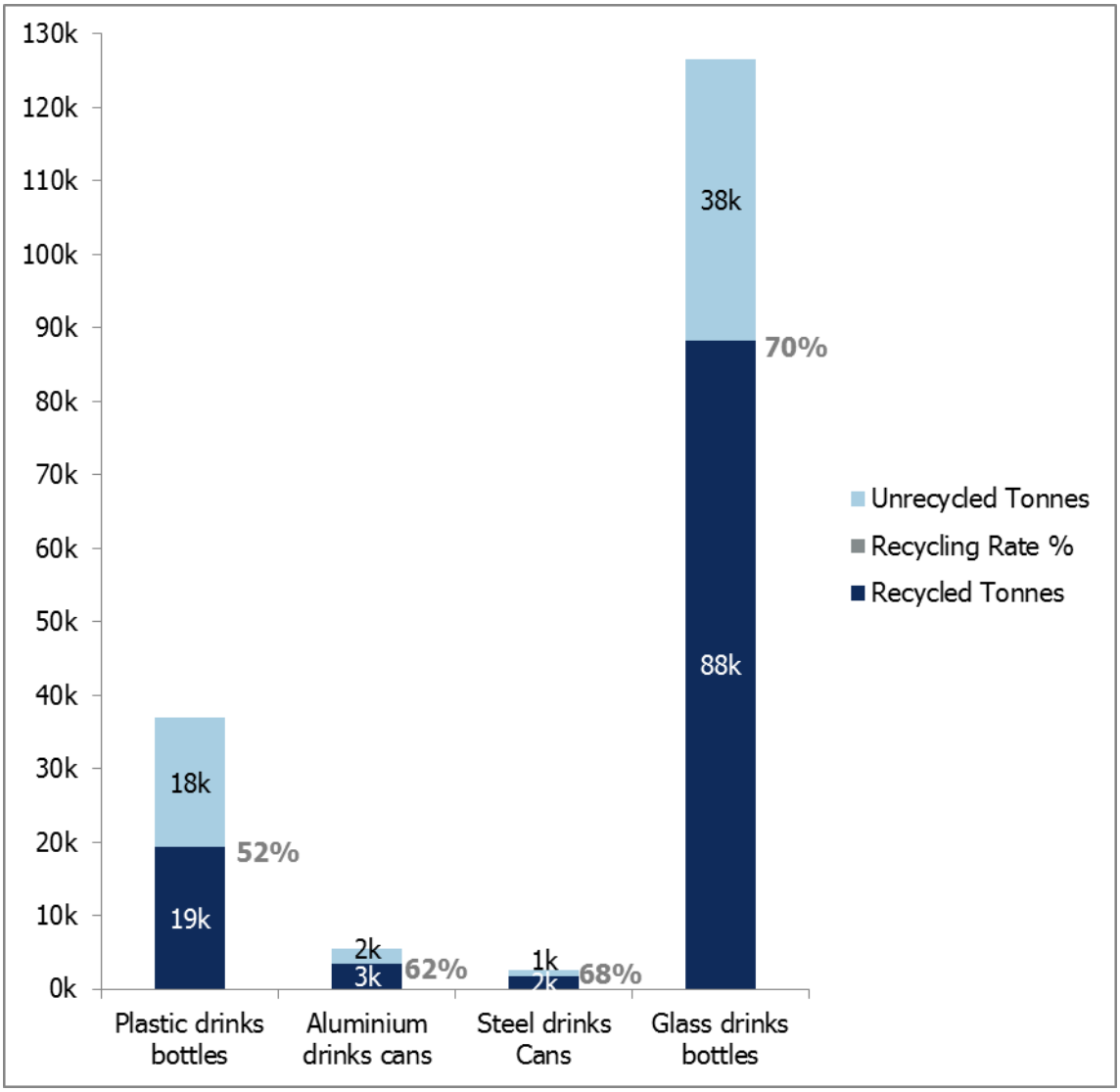

Figure 7 Beverage container recycling levels and quantities remaining in waste stream (2012)

Combined glass, plastic, aluminium and steel drinks containers are being recycled to the level of 113kt, which equates to a recycling rate of 66%, as shown in Figure 8.

This also gives the maximum quantity of drinks packaging remaining uncollected in the consumer waste stream; approximately 59kt (34%), predominantly comprised of glass (38kt) and plastic (18kt) beverage containers.

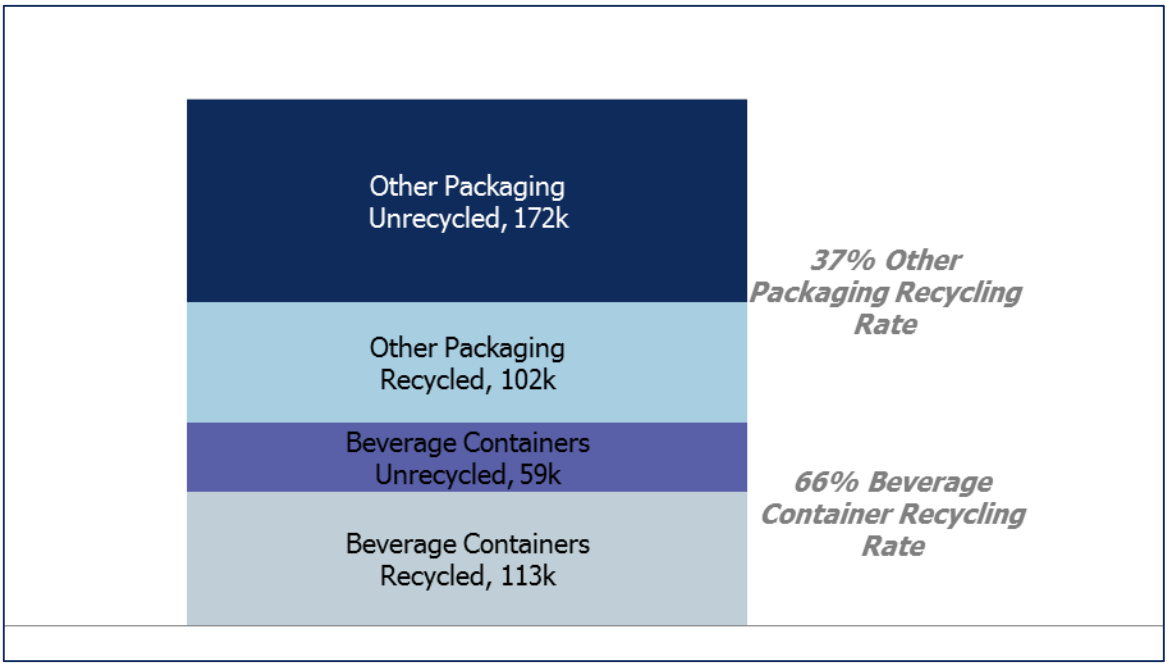

Figure 8 Combined material beverage container and 'other packaging' recycling levels (2012)

The larger proportion of unrecycled packaging is non-drinks or 'other' packaging types, with 172kt (63%) currently untapped and predominantly comprising plastic (96kt) and glass (42kt) non-beverage containers.

2.4.2 Non-Consumer Recycling

Non-consumer recycling levels have been based on UK accredited recycling as reported in the National Packaging Waste Database (NPWD)[11], minus the UK consumer recycling levels. NPWD provides data on accredited recycling by material and by quarter for the whole of the UK. In order to estimate the proportion of non-consumer packaging collected in Scotland, a percentage representing Scotland's proportion of UK businesses was used (8.7%)[5].

Figure 9 illustrates the quantities of non-consumer packaging materials collected for recycling in Scotland, as a proportion of non-consumer packaging arising placed onto the Scottish market. The recycling rates for each material vary from 25% for non-consumer plastic packaging to 89% for non-consumer paper and card packaging. Overall there remains an estimated 178kt of non-consumer packaging remaining in the Scottish waste stream. This represents 44% of all packaging waste remaining in the Scottish waste stream.

[11] http://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx

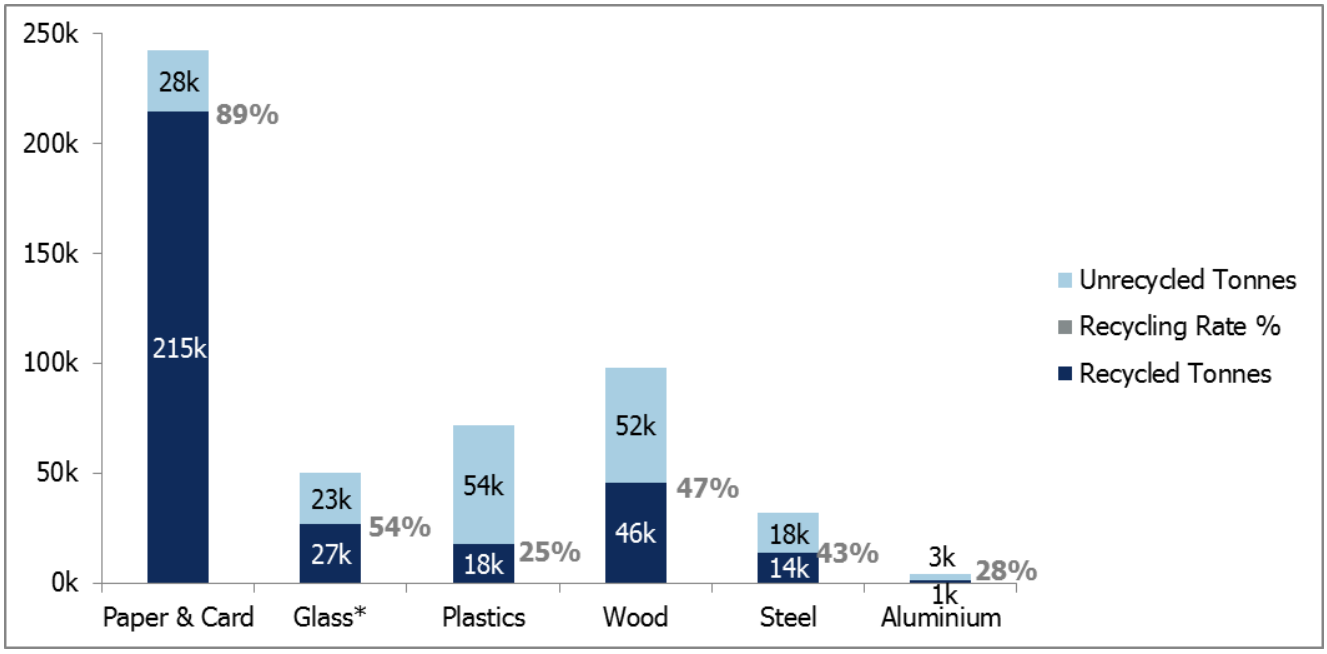

Figure 9 Scottish non-consumer packaging recycling levels by material (2012)

2.4.3 Total Scottish Recycling Levels/Rates

Total Scottish packaging recycling levels were calculated by summing the consumer and non-consumer recycling levels, as established above. These are presented in Figure 10 and as part of Appendix I.

They show that the overall packaging recycling rate for Scotland is 57% and that recycling levels vary for individual materials, ranging from 24% for plastic packaging to 85% for paper and card packaging. The proportion of UK recycling that represents material collected in Scotland is on average 8.1%, but again proportions vary per material, from 7.4% for aluminium to 8.7% for wood.

TOTAL

	SCOTLAND TOTAL FLOW (t)	RECYCLED PACKAGING COLLECTED IN SCOTLAND (t)		
Method:	*[Sum of Scottish Consumer & Non-consumer Flow]*	*[Sum of Scottish Consumer & Non-consumer Recycling]*	*[Scottish Packaging Recycling Rate]*	*[% UK Recycling that is Scottish]*
Paper & Card	330k	280k	85%	8.4%
Glass	229k	125k	55%	7.7%
Plastics	219k	52k	24%	8.0%
Wood	98k	46k	47%	8.7%
Steel	56k	27k	49%	7.6%
Aluminium	13k	4k	35%	7.1%
TOTAL	944k	534k	57%	8.2%

Figure 10 Total Scottish packaging flow on to market and packaging recycling levels (2012)

The reported recycling levels and rates for aluminium for the UK as a whole (non-consumer and total) were particularly low in 2012 as a significant quantity was recycled outside the PRN system; mainly due to Novelis being out of the market for much of the year and low PRN prices[12]. Work carried out by Valpak/WRAP and reported in the PlasFlow 2012 report[13] also suggests a considerable quantity of plastic was recycled outside of the PRN system (50-100kt), affecting the total and non-consumer recycling levels and rates. This was not identified as unique to 2012, but could be a reflection of lower PRN prices.

2.5 UK and EU Recycling Levels

In order to provide a wider context for estimated Scottish recycling rates, Figure 11 gives the recycling targets for the UK in 2012 and also those of the EU in 2012. It shows that for paper & card, plastics and wood, Scotland achieved UK and EU targets in 2012, however for the other three materials there remains a need to increase recycling levels to achieve UK and EU targets.

	Scotland 2012	UK 2012	EU
	Estimated Recycling %	Achievement Target %	Rolling Target %
Paper & Card	85%	64%	60%
Glass	55%	62%	60%
Plastics	24%	24%	23%
Wood	47%	19%	15%
Steel	48%	54%	50%
Aluminium	39%	40%	
TOTAL	57%	56%	55-80%

Figure 11 Total Scottish packaging recycling rates against UK[14] and EU targets (2012)

In order to have achieved UK 2012 recycling targets an additional 18kt (14% of glass consumption) of glass packaging would need to have been recycled, 3kt (12%) of steel and 0.2kt (3%) of aluminium packaging.

If this were to be achieved through increasing recycling of beverage containers only, it would equate to reaching a beverage container recycling rate of 84% for glass (currently 70%) and 66% for aluminium (currently 62%). For steel, even achieving 100% steel drinks can recycling (3.4kt) would miss the UK target and would require a 10% increase in non-drinks can recycling.

With regards to the EU rolling targets, these are currently under review and are expected to increase in the near future[15].

[12] Communication with Rick Hindley, CEO, alupro, 10/03/2014
[13] http://www.valpak.co.uk/information-zone/white-papers-reports
[14] Defra, Consultation on recovery and recycling targets for packaging waste for 2013-2017

3. Current UK Producer Responsibility Scheme

3.1 System Overview

The UK currently operates a 'PRN system' for packaging compliance, which is based on a principle of shared producer responsibility. An EU Directive on Packaging and Packaging Waste was brought into force in 1994, and as a result the UK implemented The Producer Responsibility Obligations (Packaging Waste) Regulations 1997 and The Producer Responsibility Obligations (Packaging Waste) Regulations (Northern Ireland) 1997. Both have subsequently been amended as the system has developed. Business targets for recycling are set within the regulations, and the UK currently has targets up to 2017.

Some targets, particularly plastic, are set to rise steeply over the next four years, presenting a challenge to the UK in being able to increase recycling rates enough to meet these targets. It has recently been announced that, following government consultation, the UK will decrease its business target for glass from 81% to 75% in 2014, following two years of high PRN prices and a re-calculation[4] (lower estimate) of the flow of glass packaging on to the UK market.

Responsibility for financing recycling of packaging is shared throughout the packaging producer chain, placing percentage based obligations on the following activities:

- Raw Material Manufacturer (6%)
- Converter (9%)
- Packer/Filler (37%)
- Seller (48%)
- Importer (100%)

Producers performing one or more of these activities, and who meet the registration thresholds outlined below, must submit data annually pertaining to packaging handled in the previous year to their relevant Environment Agency. An 'obligation' is calculated based on this data submission, and the producer must either purchase PRNs [16](Packaging Recovery Notes) as evidence of recycling to offset this obligation, or join an approved compliance scheme who carries out these functions on their behalf. A PRN can be issued by an accredited reprocessor on collected waste packaging for which the reprocessor has an end market.

3.2 Registration & Enforcement

Producers who meet a threshold of £2 million turnover and 50 tonnes of packaging handled, and perform one or more of the activities above are required to register on an annual basis with the

[15] http://www.letsrecycle.com/news/latest-news/legislation/majority-favour-higher-eu-recycling-targets, April 2014

[16] For material sent for export a PERN can be issues this is equivalent to a PRN.

relevant Environment Agency in the country where their company is registered. This can be done either directly or indirectly, through a Compliance Scheme. If a company's registered address is in Scotland, they must register with SEPA, regardless of whether they operate in England and Wales. Producers handling over 50 tonnes of packaging in Northern Ireland must also register separately there, as long as they have a physical presence in Northern Ireland, due to separate Northern Ireland packaging regulations. This means producers may have to register more than once.

4. Proposed Scottish Packaging Recovery Note

A model for a Scottish Packaging Recovery Note (SPRN) was developed following secondary research of other similar PRN based models used in other European countries (e.g. Poland) and other permit based compliance systems in the UK. An initial draft model was presented to the stakeholder workshop and received feedback from various delegates; the model was then reviewed and presented back at a follow up stakeholder workshop together with the draft Regulatory Impact Assessment (RIA) a summary of stakeholder comments from the workshops are presented in Section 6. The proposed model presented in this report includes the amendments suggested at the stakeholder workshop.

4.1 Proposed Model

The main issue in proposing a Scottish PRN system is providing an audit trail from the reprocessor issuing the SPRN back to the collection to ensure the material reprocessed did initially arise in Scotland. Currently material collected in Scotland may be consolidated and bulked with other material arising throughout the UK for reprocessing in the UK or export. There is currently no requirement to identify in which part of the UK the waste arising occurred. In general companies placing product onto the UK market can identify which part of the UK the product is sold in, however their IT systems have to be modified to specifically report this information.

In order to provide an audit trail, it is suggested that there is an additional evidence point at the waste collector, local authority or private collector. This evidence point could be part of the e-doc system[17]. The waste collector provides evidence to a compliance scheme of the quantity and quality of packaging waste material they have collected and in return the compliance scheme provides the collector with a set fee. The fee would be in recognition of the work required by the collector to provide a quality and audit system for the material. This fee would be a fixed fee in relationship to the quality and quantity of the material collected. This will also provide transparency as to where the SPRN is spent throughout the supply chain. For the waste collector to receive this payment, they would have to be accredited to SEPA. This could also be tied in with efforts of Scottish Government to improve material quality through MRF codes of practice.

The compliance scheme will not take ownership of the collector's material and the collector will be free to negotiate contracts with the end markets as per the current system. Compliance schemes will contract directly with the end market for the supply of SPRNs. It is envisaged that as the system matures, compliance schemes, collectors and reprocessors would form greater synergies to ensure a higher quality of material.

As demonstrated in the early sections of this report, if Scotland operated a packaging compliance system independent of the rest of the UK, there is the potential that an insufficient quantity of material would be collected to meet current UK recycling rates and targets. It is proposed that to provide a safeguard against this, a packaging compliance SPRN can be issued by SEPA. This

[17] http://edoconline.co.uk/

compliance SPRN would be issued in situations where there was likely to be a shortfall in the number of SPRNs available. The Secretary of State, taking evidence from stakeholders, would set the compliance SPRN value. This would occur late in the compliance year so to avoid influencing the market. The revenue generated from this would be used to fund future infrastructure investment. However the EU packaging targets would still have to be met through collection of material and the compliance PRN would not count towards an EU target.

It is also proposed that a litter fee be introduced for the quantity of material being placed on the market but not recycled which could potentially end up as litter. This would incorporate the principle of extended producer responsibility. The fee would be based on the quantity of packaging material in litter and the cost of litter clean-up. This fee would be paid by producers as part of their compliance fee. Compliance schemes would then transfer this fee to the appropriated Agency. As recycling targets increase, the quantity of packaging litter should decrease and subsequently the fee would reduce. This litter fee could form part of the collection fee and some of the review from the SPRN given to it as well as additional funding from producers. Under a voluntary agreement, to avoid the need for primary legislation, the scope of Consumer Information Obligations could be extended to include a litter fee.

The incorporation of a litter fund will introduce the potential to undertake litter awareness campaigns that will reduce the quantity of littering. Both types of initiative should present cost-savings for local authorities. It would be assumed that to ensure the appropriate governance of this fund targets would be put in place to assess the effectiveness of awareness campaigns.

The other proposed amendment to the current UK system is the introduction of carbon ratings for reprocessors. In order to drive the best environmental option for recycling of Scottish packaging material it is proposed that reprocessors are carbon rated and that a certain percentage of SPRNs have to be purchased from upper band/higher rated reprocessors, this banding would be set based on available reprocessing capacity. Scottish export PRNs would have to include the transport element in their carbon calculation. If specific information was not available for the reprocessor then an industry average could be used. This would be similar to the current model used for glass PRNs where there is a sub-target for glass sent to remelt and glass sent to aggregate markets.

A schematic diagram of the flow of data and material is displayed in Figure 12 and the flow of finance demonstrated in Figure 13.

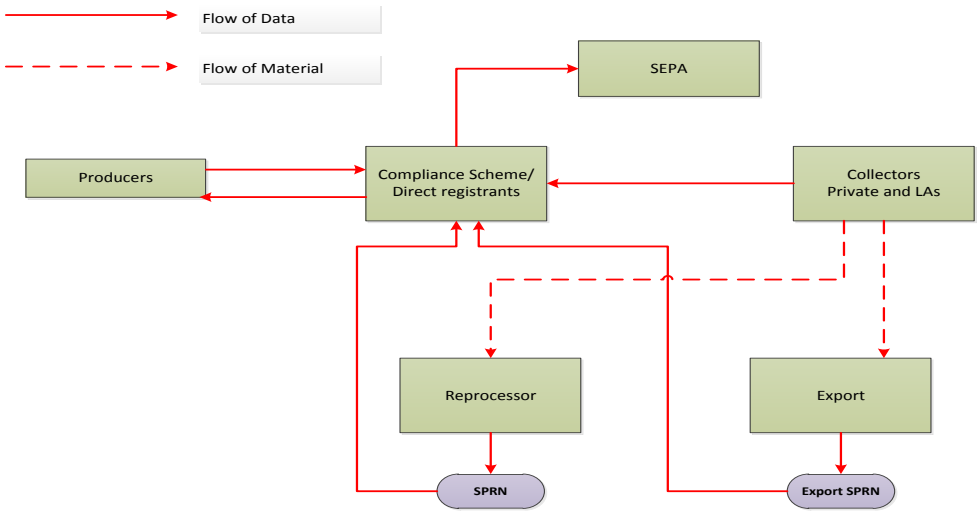

Figure 12 Proposed Scottish PRN model - flow of data

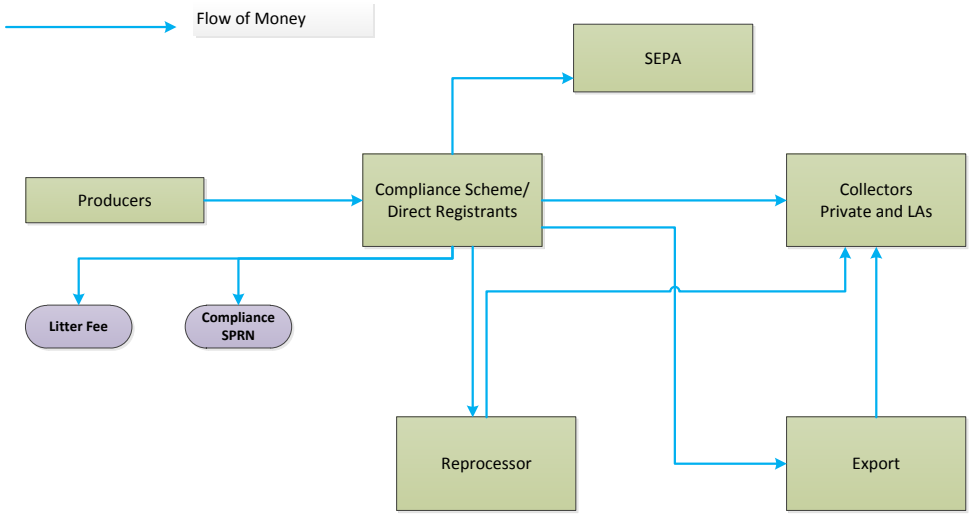

Figure 13 Proposed Scottish PRN model - flow of finance

Other optional enhancements that are proposed in the Scottish PRN model, representing technical differences from the current UK PRN model include the following;

- The current UK de-minimus threshold for packaging placed on the UK market is defined as a company performing an activity on packaging with a turnover of more than £2M and handling more than 50 tonnes of packaging. The 50 tonnes threshold refers to packaging placed on the UK market; as Scotland is a much smaller market it is proposed that this 50 tonne threshold is reduced proportionately to 5 tonnes. As a consequence of the quantity threshold being reduced it may be appropriate to scrap the turnover threshold for de-minimus.
- Raw material manufacturers and convertors obligations could use a protocol, or remove them and re-allocate their obligation share to other parts of the supply chain, which; if a Scottish specific system were introduced it may not be feasible for raw material manufacturers and convertors to accurately provide Scottish specific data. However it is

believed that the number of business likely to be affected by this will be small as the majority of products will be imported into Scotland and it will be the initial importer that will pick up the rolled up obligation.

- Potential introduction of format or polymer specific targets for packaging materials; these could enhance the performance of the PRN model and improve the collection rates of certain packaging materials. For example having separate targets on plastic bottles and plastic PTTs, which had estimated Scottish recycling rates of 55% and 19% respectively in 2012[18].

The above options are not mutually dependent and therefore none, one or a combination the above could be adopted.

4.2 Costs

Identified additional costs to the current system are described below. The actual figures have been included in the RIA calculations in Section 5 of this report.

4.2.1 Registration

Currently organisations only have to register with the English or Scottish enforcement authorities (in addition to Northern Ireland should they handle 50 tonnes or over of packaging there), if they are above the threshold for the packaging regulations. If a Scottish specific PRN were to be introduced businesses registered in Scotland and who trade in Scotland and companies that import goods into Scotland would need to be registered with SEPA. This would require many companies to have dual registration as they would additionally be required to register with other UK enforcement agencies for the remainder of the packaging material they place on the UK market outside of Scotland and therefore incur two or three registration fees.

4.2.2 Compliance Costs

If a separate system were introduced there would be additional compliance costs placed on organisations in terms of separating out their Scottish specific sales data and joining a Scottish specific compliance scheme. It is assumed that the bulk of this cost would occur in an organisation's first year of compliance due to the setting up of IT systems to record/report the appropriate data. Administration by a compliance scheme is likely to be an annual cost.

In addition, compliance costs incurred relating to the quantities of materials placed on to the Scottish market should be complimentary to those placed on to the market elsewhere in the UK, i.e. where a Scottish obligation is identified, this should be removed from data reported to the EA and invoiced by English/Welsh compliance schemes.

4.2.3 Monitoring Costs

In the model it has been proposed that there is a need for a monitoring point for quantities of packaging collected by local authorities and private collectors. Currently monitoring of the PRN

[18] Estimates made using a joint Valpak/RECOUP methodology, based on Valpak's EPIC plastic weights and retail sales data, Valpak's 2012 plastics composition data and RECOUPs 2012 Scottish collection data. Composition data was amended to include bottles, lids, closures and labels.

system occurs at the reprocessor stage of the supply chain. This additional monitoring point will incur additional costs in the form of establishing a SEPA audit trail, including from any sub-contracted waste collectors. It is believed that this additional cost will largely be covered by the fees from the increase in the number of companies that will need to register with SEPA, and by accreditation fees from waste collectors for specified quality levels of packaging waste. There is currently Scottish Government initiatives to improve the quality of recyclate collected and it is believed that this would reward the collectors for the improved quality.

4.2.4 Litter Fee

The model proposes an additional litter fee for producers that will be linked to the quantity of unrecycled packaging material in Scotland. This is an additional cost for businesses, but as this cost has been borne by local authorities it is not really additional to the system; rather the responsibility for some litter collection costs will shift between stakeholders.

4.3 Benefits

The key benefits of the proposed systems are:

- **More accurate recording and monitoring of Scottish data**
  The proposed system would enable more accurate reporting of both packaging recycling and total packaging flow for Scotland, which could then be used by Scottish Government to determine future targets.
- **Scottish specific recycling targets**
  In the key materials of glass, steel and aluminium Scottish packaging recycling rates are currently below that of the rest of the UK and for glass and steel, would not meet UK packaging targets (Section 2.4). Researching the reason for this is beyond the scope of this project, but it is believed to be as a consequence of the geography of Scotland and population distribution and little Energy from Waste with subsequent ferrous extraction, as well as housing types in large conurbations. One of the key benefits of the proposed system is that it will specifically target Scottish packaging material and additional funding will be provided through the compliance fee to ensure future targets are met.
- **Transparent distribution of SPRN funding**
  A criticism of the current UK PRN system is that the distribution of funding through the supply chain is not as transparent as stakeholders would wish. Having direct funding from a proportion of the SPRN at the collection point will aid transparency of how SPRN money is spent and better ensure the quality of recyclate that is collected.
- **Incorporation of extended producer responsibility**
  Currently producers are only required to take responsibility for the proportion of the material they place on the market that is recycled in order to meet set targets. Extended producer responsibility takes account of all the material producers place on the market; extending producers responsibilities for some unrecycled material, in the form of a litter fee, means that the system incorporates extended producer responsibility.
- **Reduced costs for local authorities**

The proposal to introduce a litter fee into the system this should reduce the cost of litter collections for local authorities. The cost of clearing litter would be shared between the local authorities and through the litter fee obligated organisations that place packaging material onto the market would also pick up some of the costs.

- **Improved environmental performance**
  The proposed system suggests a high/low carbon rating for reprocessors which should drive up environmental performance and ensure that recycling of packaging waste is helping Scotland achieve a low carbon economy in an efficient manner.

4.4 Impact on Local Authorities

As the proposed Scottish PRN system is an enhancement of the current UK system it is thought that the impact on local authorities will be generally positive. The main areas that will be impacted by the change are: potential increased funding for local authorities through SPRN monitoring and funding at collection points (potentially better supporting collection costs in rural areas) and shared litter collection costs with obligated producers. Establishing an audit trail for SEPA and any sub-contracted collectors may present a small additional burden. These impacts are discussed in more detail in the following sections.

A significant proportion of packaging waste is collected by private waste management companies either on behalf of local authorities or from commercial collections. There may be commercial contracts between the local authority and the private collector that would mean that this additional funding would remain with the private collector and would not be transferred to the LA.

4.5 Increased Funding

The proposed system is placing only a small additional burden on local authorities but is not changing the route of material through the waste stream therefore undermining local authority waste contracts. However it is proposed that the local authority collection point following sorting and bulking is an evidence point for the proposed system. A compliance scheme will issue a collection note to the LA or private waste management company for the quantity of material that has been collected assuming a suitable quality standard is met. This will be additional funding which could be used to ensure that quality standards are improved or maintained. The direct impact of this should be they can obtain a higher value for their waste packaging material.

The incorporation of a litter fund will introduce the potential of funding to cover the cost of litter collection and also to undertake litter awareness campaigns or other interventions that will reduce the quantity of littering. Both types of initiative should present cost-savings for local authorities but will have different impact on the quantity of litter arising.

4.5.1 Rural Collections

If, as is proposed, Scottish specific packaging targets are set and compliance schemes are required to contract with waste collectors for evidence, then this will support collections from rural areas of Scotland. As Scotland is a smaller population size and more dispersed than the rest of the UK,

collections will have to occur from rural areas in order to achieve the Scottish specific targets. The introduction of an evidence point at collection this will directly fund some of those collections. In addition with the introduction of compliance fee in case of a shortage of SPRNs ensures that the targets will always be achieved for businesses, as any monies collected through the compliance fee would be distributed to where untapped material can be found, including rural areas which might have been missed due to higher costs of collections. However EU targets can only be met through actual collected material so a compliance fee could not be used to achieve EU targets.

4.6 Suitability for Other Materials

One of the objectives of the report was to identify other materials that would be suitable for a SPRN system. As can be seen from the establishment of WEEE and batteries producer responsibility systems in the UK, additional, similar systems can be developed for other material streams. Current products that have a high environmental impact, are generally disposed of to landfill, but don't attract any producer responsibility legislation include clothing, non-clothing textiles, footwear, carpets and mattresses.

4.7 Split Targets

Introducing separate packaging format and/or polymer targets in addition to packaging material targets can help increase the recycling of specific packaging types that are not currently extensively collected throughout Scotland, for example consumer plastic pots, tubs and trays and plastic film.

4.8 Legislative Implications

It is understood that if a Scottish PRN were to be introduced and obligation removed from the current UK system and placed in a separate Scottish system, this would require a change in the primary legislation (Environment Act 1995) that underpins the Producer Responsibility Obligations Regulations. Any amendments to this Act would have to go through the UK Parliament.

5. Regulatory Impact Assessment

5.1 Introduction

This section of the report presents a Regulatory Impact Assessment (RIA) which considers the costs and benefits of the proposed options for an enhanced Scottish PRN system against the current regime. The analysis considers four potential options and breaks down the costs and benefits of each with a full explanation of how the figures were reached and all the assumptions made. It is completed over the period 2015 to 2020 as this is when it is expected that any changes to the current system would be implemented. A further analysis to 2030 is also completed to provide a longer term view.

The costs associated with the enhanced Scottish PRN system include the payment of the proposed litter fee, local authority (LA) monitoring costs, carbon enforcement costs and the associated business costs. There are also various benefits which include the increase in collected packaging waste and associated material value, reduced levels of litter, disamenity benefits that arise from reduced amount of waste going to landfill, and carbon benefits from improved environmental performance from accredited reprocessors.

This section includes a clarification of these options, a detailed explanation of the various costs and benefits that have been included and the assumptions made when calculating the figures. This allows scrutiny of where the data has come from and can be used to identify possible areas for improvement in the model.

5.1.1 Option 1 – Current System

The first option modelled is a 'Current System' scenario. This assumes that there is no change to the producer responsibility system within Scotland and the UK PRN system as detailed in Section 3 continues. The RIA looks to analyse the impacts of any changes to the system therefore the Current System option will have a net impact of £0.

5.1.2 Option 2 – Full Implementation

The second option modelled is the full implementation. This will be based on the system proposed in Section 4. All the associated costs and benefits of this Option are discussed in the Section 5.2.

5.1.3 Option 3 – Litter & Data

The third option modelled is a litter and data scenario. In this option, obligated businesses will pay a litter fee and have to report Scottish separate tonnages as part of their UK submission. However, no other elements of the full implementation are adopted, so Scotland would still operate within the UK PRN system as before.

This option would also allow the monitoring of the progress that Scotland may make towards higher recycling rates without the full introduction of a SPRN.

5.1.4 Option 4 – Voluntary Participation

The final option is one of voluntary participation. In this option, there are no mandated changes required from obligated businesses but a litter fee is set up to be paid on a voluntary basis and this is charged at the UK rate.

5.2 Assumptions & Calculations

5.2.1 Packaging Flow

The Scottish Flow figures for Option 1 to 4 are based on those detailed in Section 2 of the report. The growth rates applied to each packaging stream have been taken from PackFlow 2017[19]. These are highlighted in Figure 14[20].

	2013	2014	2015	2016	2017	2018	2019	2020	Ave Annual Growth
Aluminium	12,812	12,915	13,018	13,122	13,227	13,333	13,440	13,547	0.8%
Paper & Card	331,189	332,845	334,509	336,181	337,862	339,551	341,249	342,955	0.5%
Glass	231,510	233,825	236,164	238,525	240,910	243,320	245,753	248,210	1.0%
Plastics	223,442	227,911	232,469	237,119	241,861	246,698	251,632	256,665	2.0%
Steel	55,422	55,283	55,145	55,007	54,870	54,733	54,596	54,459	-0.2%
Wood	98,365	98,857	99,351	99,848	100,347	100,849	101,353	101,860	0.5%
Total	952,741	961,636	970,656	979,803	989,078	998,484	1,008,023	1,017,697	0.9%

Figure 14 Scottish Packaging (T) 2013 – 2020

For Option 1 and 3 it is assumed that the recycling rates will be based on the current rates within Scotland, which are lower than those of the UK for glass and steel, and will increase at the same pace as the UK recycling targets[21]. For Option 2 and 4 it is assumed that the recycling rate in Scotland will match the UK once the system is implemented and then increase in line with the UK recycling targets[21]. It is assumed that Option 2 will have higher recycling rates due to the presence of Scottish specific targets requiring Scottish specific material to be collected, forcing improved performance. For Option 4 the rate is assumed to increase as the litter fee is voluntary and will be charged on the UK recycling rate incentivising obligated organisations to recycling the equivalent amount of Scottish material.

5.2.2 Litter Fee

The current producer responsibly system within the UK sees obligated organisations pay towards the recycling of a proportion of the packaging they place onto the market. This proportion is dictated by

[19] http://www.valpak.co.uk/docs/default-source/environmental-consulting/packflow_2017.pdf?sfvrsn=0
[20] When the extended analysis to 2030 is completed the growth rates for each material are held at the same level to 2030.
[21] https://www.gov.uk/government/policies/reducing-and-managing-waste/supporting-pages/packaging-waste-producer-responsibility-regimes

the business targets set by Defra[21], however the overall recycling rates are not the same as the business targets due to unobligated organisations also placing packaging onto the market.

	Business Target	Overall Recycling	Proportion Obligated
Aluminium	43%	42%	97%
Paper & Card	70%	66%	95%
Glass	81%	62%	77%
Plastics	37%	27%	74%
Steel	72%	54%	75%
Wood	22%	22%	100%

Figure 15 summarises the business targets for each packaging stream in 2013 and the equivalent level of total recycling this accounts for.

	Business Target	Overall Recycling	Proportion Obligated
Aluminium	43%	42%	97%
Paper & Card	70%	66%	95%
Glass	81%	62%	77%
Plastics	37%	27%	74%
Steel	72%	54%	75%
Wood	22%	22%	100%

Figure 15 Current Business Targets & Overall Recycling Equivalent

This demonstrates that there is an element of packaging that is not currently picked up within the current producer responsibility regulations; 58% of aluminium packaging, 34% of paper & card packaging and so on. It is therefore suggested that the litter fee is charged on this remaining unrecycled packaging[22]. This would ensure that all the packaging in Scotland would be covered by an element of producer responsibility, potentially resulting in more efficient price signals and better incentives for waste management within the market[23].

This is best achieved within the current framework, meaning the burden again falls upon the obligated organisations to pay a litter fee for the remaining unrecycled packaging (that has the potential to be litter) they do not already pay for. Figure 16 highlights the proportion of material placed on to the market that needs to be picked up by the litter fee and the requisite business target required to achieve this.

	Flow to be Picked Up	Litter Business Rate	Unobligated Tonnage
Aluminium	58%	60%	7,398

[22] Although not all unrecycled packaging will end up as litter, it has the potential to be litter and to achieve full producer responsibility is included in the litter fee

[23] http://www.ncbi.nlm.nih.gov/pubmed/22993134

Paper & Card	34%	36%	111,714
Glass	38%	49%	86,874
Plastics	73%	98%	159,038
Steel	46%	61%	25,447
Wood	78%	78%	76,735

Figure 16 Required Litter Business Target (Including Unobligated Tonnage)[24]

Therefore obligated organisations would be required to pay a litter fee on 60% of the aluminium they place onto the market in addition to 43% they pay to recycle it in order to achieve a 100% producer responsibility coverage for packaging[25].

It is proposed that the value of the litter fee is set at a maximum of the annual cost of litter packaging pick-up within Scotland. The total cost of litter pick-up within Scotland is believed to be £36M[26], and it is believed that packaging makes up 21% of the litter pick up costs[27]. Therefore the cost of picking up litter packaging within Scotland can be assumed to be £7.56M[28]. Figure 16 also highlights the tonnage of packaging that is currently not being picked up by the producer responsibility regime and is to be paid for via the litter fee.

Based on the total unobligated tonnage shown above (467k) and the total value required of the litter fee (£7.56M), it is suggested that the litter fee per tonne be £16.18. The litter fee payment will be

[24] The "flow to be picked up" needs to be scaled up to account for the sub-threshold business which is how the "litter business rate" is calculated based on the proportion obligated in

	Business Target	Overall Recycling	Proportion Obligated
Aluminium	43%	42%	97%
Paper & Card	70%	66%	95%
Glass	81%	62%	77%
Plastics	37%	27%	74%
Steel	72%	54%	75%
Wood	22%	22%	100%

Figure 15. For example the plastic figures of 98% may seem high, however 73% of the plastic flow is not picked up by the business target for packaging recovery and this needs to be scaled up further to account for non-obligated organisations.

[25] This adds up to more than 100% as the obligated organisations need to cover the burden of the unobligated organisations

[26] http://www.zerowastescotland.org.uk/sites/files/wrap/Scotland's%20Litter%20Problem%20-%20Full%20Final%20Report_0.pdf

[27] This was calculated by taking the average of the number of items littered that were packaging (1.3% - http://www.incpen.org/displayarticle.asp?a=46&c=3) and the tonnage of packaging (41.5% - http://www.zerowastescotland.org.uk/sites/files/wrap/Scotland's%20Litter%20Problem%20-%20Full%20Final%20Report_0.pdf). This was thought to be a good proxy for proportioning cost as it accounts for limiting factors such as time (time spend picking up litter will be proportionate to the number of items) as well as capacity (with will be weight based as well as volume based which can be assumed to be impacted by both frequency and weight of litter)

[28] This was calculated on the most up to date data available and it is assumed the cost of pick up in 2015, when the scheme is implemented, will be the same.

larger for Option 3, as the recycling rates will be lower and therefore the potential amount of litter higher so the obligated organisations will be required to pay a higher fee. It is assumed that in the first year the first five million collected by the litter fee would go towards additional spending on litter preventative activities such as communication and marketing. It is assumed that this would result in litter dropping by 3% each year (and the five million additional payment would therefore also drop by 3% each year). The remainder of the litter fee would displace the current costs of litter collection borne by the local authorities and as the RIA only models changes in costs or benefits only the additional five million payment is modelled. The cost of the litter fee going forward is provided in Figure 17 below. All figures shown are in today's prices.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£ 5,000,000	£ 4,850,000	£4,704,500	£ 4,563,365	£ 4,426,464	£ 4,293,670
Option 3	£ 5,000,000	£ 4,850,000	£4,704,500	£ 4,563,365	£ 4,426,464	£ 4,293,670
Option 4	£ 5,000,000	£ 4,850,000	£4,704,500	£ 4,563,365	£ 4,426,464	£ 4,293,670

Figure 17 Total Litter Fee 2015 - 2020[29]

The total cost to business of the litter fee is shown in Figure 18, however only the figures shown in Figure 17 are included in the RIA.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£ 5,720,031	£5,590,823	£5,446,113	£5,509,535	£5,573,994	£5,639,507
Option 3	£ 6,452,917	£6,330,099	£6,191,850	£6,261,807	£6,332,874	£6,405,070
Option 4	£ 5,720,031	£5,590,823	£5,446,113	£5,509,535	£5,573,994	£5,639,507

Figure 18 Litter Fee Total Cost to Business 2015 – 2020

In terms of implementation of the litter fee stakeholders indicated that those paying the fee could report on this through the Consumer Information Obligation (CIO). This stipulates that organisations that carry out a selling activity (i.e. supply packaging to an end user in Scotland) provide these end users with information on:

- Where packaging can be recycled
- The end user role in recycling
- The meaning of labels on packaging
- Relevant chapters on packaging in the National Waste Strategies

5.2.3 Compliance Costs

For both Option 2 and 3, obligated organisations in Scotland may need to register with SEPA in addition to other national environment agencies, therefore incurring two or three registration fees. There are currently 6,906 obligated organisations currently in the UK (6,906 in total) and those who operate in Scotland (either directly or as an importer) would also need to register with SEPA. It is

[29] When modelled to 2030 the 3% drop is carried forward

estimated that there are 343,105 private enterprise businesses operating in Scotland[30], with the equivalent figure in the UK being 4.9 million[31]. Applying this split to the 6,906 obligated organisations there would be approximately 484 organisations that would be required to directly register in Scotland. It is assumed that approximately the same amount of organisations again would need to register as importers, bringing the total number of organisations who needed to register with SEPA to approximately 1,000.

The registration fee was assumed to be the same as the EA, £564 per annum. It is assumed that both the fee and the number of organisations remain constant over the period 2015-2020. The additional compliance costs are provided in Figure 19.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£ 564,000	£ 564,000	£564,000	£564,000	£ 564,000	£ 564,000
Option 3	£ 564,000	£ 564,000	£ 564,000	£ 564,000	£ 564,000	£ 564,000
Option 4	£ -	£ -	£ -	£ -	£ -	£ -

Figure 19 Compliance Costs 2015 - 2020

5.3 LA Monitoring Costs

It is assumed that local authorities would require an additional member of staff to manage any additional reporting and monitoring. This is presumed to be equivalent to a quality assurance manager, whose average annual wage is £28,495[32]. An additional quarter[33] is added to this figure to account for additional cost to the LA of managing the extra staff member. This will be required for all local authorities in Scotland, of which there are 32. The LA monitoring costs will only be picked up by Option 2. The cost of LA monitoring is provided in Figure 20.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£ 1,139,780	£ 1,139,780	£ 139,780	£ 1,139,780	£ 1,139,780	£ 1,139,780
Option 3	£ -	£ -	£ -	£ -	£ -	£ -
Option 4	£ -	£ -	£ -	£ -	£ -	£ -

Figure 20 LA Monitoring Costs 2015 - 2020

5.3.1 Carbon Enforcement Costs

[30] http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/Corporate/KeyFacts
[31] http://www.fsb.org.uk/stats
[32] http://www.payscale.com/research/UK/Certification=ISO_Internal_Auditor/Salary All figures are in todays prices and it is assumed the salary level will remain constant in todays prices
[33] £7,124

In order for the reprocessors to be adequately monitored in terms of carbon it is assumed that a carbon footprint will need to be completed at each of the Scottish reprocessors. This is assumed to be £3,000 per site in the first year and £1,500 to updated each year thereafter, based on Valpak knowledge. The number of accredited reprocessors in Scotland is 15. This only applies to Option 2. It should be noted that these costs would only be borne by reprocessors in Scotland, and not those in the rest of the UK. There would also be SEPA audit costs associated with the carbon footprints. It is assumed that this would cost £500 per site, per year based on Valpak market knowledge. Assuming all reprocessors complete a carbon footprint and are audited the carbon enforcement costs are provided in Figure 21.

Carbon footprints of Scottish reprocessors would only be required by SEPA in terms of assessing potential carbon reductions relevant to Scotland. If exporters, or English reprocessors for example, wished to apply to be a higher carbon-performing facility, this would be possible on submission of the relevant information.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£52,500	£30,000	£30,000	£ 30,000	£ 30,000	£ 30,000
Option 3	£ -	£ -	£ -	£ -	£ -	£ -
Option 4	£ -	£ -	£ -	£ -	£ -	£ -

Figure 21 Carbon Enforcement Costs 2015 - 2020

5.3.2 Cost to Business

In order to provide Scottish specific data it is assumed all 1,000 obligated organisations who needed to register with SEPA will also need to spend an additional amount of time pulling out Scottish data. It is assumed that this will take longer in the first year. It is assumed that an IT Consultant will be required, day rate £500, for two days in the first year and one day for each year thereafter. In terms of the number of obligated organisations who need to provide Scottish data it is assumed that all those currently obligated in the UK will have some element of business within Scotland and so the total number of obligated businesses are used.

It is assumed that due to separate Scottish data being required more time would be required in weighing the relevant packaging in order to provide more robust data. This is assumed to be two days a year per organisation at a cost of £500 per day, based on Valpak market knowledge. Additionally reprocessors who operate in Scotland would also need to register with SEPA as well as the EA. There are 15 accredited reprocessors in Scotland and it is assumed that the registration fee would be the same as the EA, £1,561 (average between small and large reprocessor). The costs to business are provided in Figure 22. This would be required for Option 2 and 3 as it is mandated and also for Option 4 as if organisations are to recycle the requisite amount of Scottish material they would require an understanding of how much they are placing onto the market.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£ 2,023,408	£ 1,523,408	£1,523,408	£1,523,408	£1,523,408	£1,523,408

Option 3	£ 2,023,408	£ 1,523,408	£1,523,408	£1,523,408	£1,523,408	£1,523,408
Option 4	£ 2,023,408	£ 1,523,408	£1,523,408	£1,523,408	£1,523,408	£1,523,408

Figure 22 Cost to Business 2015 - 2020

5.3.3 Disamenity from Landfill

The proposed new system includes benefits such as the potential for reduced levels of material going to landfill. The disamenities from landfill include the associated noise and odour for residents within the vicinity of the landfill site[34]. In order to estimate the total cost of this, a Defra study was drawn on, which provided estimations of £2 per tonne[35] for the disamenity costs of landfill in the UK. However this was a report from 2002 so the figure needs adjusting to consider inflation. The average annual rate of inflation in the UK between 2003 and 2014 was 2.46%[36] so assuming an increase of 2.46% every year the £2 would, at the start of 2014, be equal to £2.68.

There also needs to be an estimate made on the amount of packaging that avoids landfill; this benefit is only accrued by Option 2 as Option 3 has no increase in recycling against the baseline Option 1. The increase in packaging recycling for Option 2 is shown in Figure 23.

	2015	2016	2017	2018	2019	2020
Aluminium	400	403	406	409	413	416
Paper & Card	6,835	6,870	6,904	6,938	6,973	7,008
Glass	30,882	31,190	31,502	31,817	32,135	32,457
Plastics	2,876	2,934	2,993	3,052	3,114	3,176
Steel	4,050	4,040	4,030	4,020	4,010	4,000
Wood	249	250	252	253	254	255
Total	45,292	45,687	46,086	46,490	46,899	47,312

Figure 23 Increase in Packaging Recycling (T) 2015 – 2020 (Option 2)[37]

Of the increase in packaging recycling it is assumed that a proportion is diverted from landfill and another avoided litter. Given that the level of litter in Scotland is 15,000t[38], of which 42% is packaging

[34] It should be noted that this does not account for any associated carbon savings

[35] http://archive.defra.gov.uk/environment/waste/strategy/legislation/landfill/documents/landfill_disamenity.pdf

[36] http://www.rateinflation.com/inflation-rate/uk-historical-inflation-rate.php

[37] This was calculated by taking the difference in the current UK recycling performance v Scottish recycling performance (and projected forward as stated) as this is the increase in performance that is assumed to be achieved in Option 2.

[38] http://www.zerowastescotland.org.uk/sites/files/wrap/Scotland's%20Litter%20Problem%20-%20Full%20Final%20Report_0.pdf

by weight[39], and 406,000 tonnes of packaging was not recycled in Scotland in 2012[40], it is assumed that 2% of non-recycled packaging in Scotland becomes litter. Therefore of the tonnage increase in recycling for Option 2 and 4, as shown in Figure 23, 98% is diverted from landfill and valued at £2.68 per tonne. Figure 24 shows the associated benefits of this landfill diversion. It should be noted that landfill tax has not been included in this analysis as this may increase savings for private business, but reduces revenue for central government so the net impact is 0.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£119,550	£120,592	£121,646	£122,712	£123,790	£124,880
Option 3	£ -	£ -	£ -	£ -	£ -	£ -
Option 4	£119,550	£120,592	£121,646	£122,712	£123,790	£124,880

Figure 24 Disamenity from Landfill 2015-2020

5.3.4 Litter Avoidance

The increase in packaging recycling seen in Option 2, Figure 23, would reduce the amount of packaging that is being littered. This is assumed to be 2% of the material that is now recycled given that the level of litter in Scotland is 15,000t[38], of which 41.5% is packaging[39], and 406,000 tonnes of packaging was not recycled in Scotland in 2012. The direct saving under Option 2 and 4 is the cost of collection of this litter, which has been assumed to be £16.18 per tonne.

In addition to this the £5 million fund generated by the litter fee and spent on additional litter prevention activities is expected to reduce litter by 3% per year and the equivalent collection costs are included for Option 2 and Option 3. The associated benefits of this are shown in Figure 25. It should be noted that the indirect costs of litter (including the potential for increased crime, mental health etc) which would be avoided through the reduction in litter have not been included as they were judged to subjective to quantify.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£14,092	£14,098	£14,107	£14,121	£14,138	£14,158
Option 3	£3,022	£2,931	£2,843	£2,758	£2,675	£2,595
Option 4	£14,092	£14,098	£14,107	£14,121	£14,138	£14,158

Figure 25 Direct Litter Avoidance Benefits 2015-2020

5.3.5 Carbon Savings

It is assumed that as Scottish reprocessors will be required to measure their carbon performance they will make efforts to reduce their carbon footprint (Option 2 only). It is assumed that this

[39] http://www.zerowastescotland.org.uk/sites/files/wrap/Scotland's%20Litter%20Problem%20-%20Full%20Final%20Report_0.pdf

[40] Figures taken from Figure 10

improvement will be 5%[41]. The carbon footprint of recycling packaging is assumed to be 21 $kgCO_2e$[42] and by combining this with the known level of packaging recycling it is possible to calculate the carbon saving of recycling in Scotland for Option 2. In order to account for the indirect benefits of the carbon saving the short-term traded carbon values are used[43]. The associated carbon benefits are shown in Figure 26.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£93,087	£98,759	£104,934	£113,966	£123,427	£133,877
Option 3	£ -	£ -	£ -	£ -	£ -	£ -
Option 4	£ -	£ -	£ -	£ -	£ -	£ -

Figure 26 Carbon Savings 2015-2020

5.3.6 Material Benefit

Option 2 and 4 would provide increased recycling (Figure 23) and the RIA considers the value of this material that was previously lost to the system. Therefore the average value for each of the main packaging streams in 2013 was taken from letsrecycle[44] and this was added the average PRN value in 2013. This was then multiplied by type 2 Gross Value Add multiplier of 1.63[45] These values were combined with the tonnage of additional material that was now being captured by the system and being recycled and is shown in Figure 27.

	2015	2016	2017	2018	2019	2020
Option 1	£ -	£ -	£ -	£ -	£ -	£ -
Option 2	£7,349,318	£7,415,595	£7,482,731	£7,550,739	£7,619,632	£7,689,422
Option 3	£ -	£ -	£ -	£-	£ -	£ -
Option 4	£7,349,318	£7,415,595	£7,482,731	£7,550,739	£ 7,619,632	£7,689,422

Figure 27 Material Benefit 2015-2020

[41] Based on Valpak market knowledge
[42] http://www.ukconversionfactorscarbonsmart.co.uk/
[43] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48186/3137-update-short-term-traded-carbon-values-uk.pdf
[44] http://www.letsrecycle.com/prices
[45] Input Output Metrics, Scottish Executive 2009

5.4 Results

The results of the RIA are shown in Figure 28 below.

	2015	2016	2017	2018	2019	2020	Total
Option 1	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Option 2 Total	-£1,203,641	-£458,145	-£238,270	-£19,015	£197,334	£411,479	-£1,310,258
Option 3 Total	-£7,584,386	-£6,934,476	-£6,789,064	-£6,648,015	-£6,511,196	-£6,378,483	-£40,845,620
Option 3 Total	£459,552	£1,176,876	£1,390,576	£1,600,799	£1,807,688	£2,011,382	£8,446,873

Figure 28 RIA Results 2015 - 2020

The results suggest that between 2015 and 2020 the option with the highest NPV, based on the assumptions outlined in Option 4 "Voluntary Participation". The key assumption this is based on is that the voluntary agreement would deliver the same increased recycling rates as Option 2 "Full Implementation". Both Option 2 "Current System" and 3 "Litter & Data" have a negative NPV over this period, however in 2019 and 2020 Option 2 is positive.

Figure 29 highlights these options over a long period of analysis, 2015-2030. Over this period Option 2 "Full Implementation" has a positive net present value.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Option 1	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Option 2 Total	-£1,204k	-£458k	-£238k	-£19k	£197k	£411k	£617k	£819k	£1,019k	£1,216k	£1,412k	£1,604k	£1,795k	£1,984k	£2,170k	£2,355k	£13,681k
Option 3 Total	-£7,584k	-£6,934k	-£6,789k	-£6,648k	-£6,511k	-£6,378k	-£6,250k	-£6,125k	-£6,004k	-£5,886k	-£5,772k	-£5,662k	-£5,555k	-£5,451k	-£5,350k	-£5,252k	-£98,151k
Option 4 Total	£460k	£1,177k	£1,391k	£1,601k	£1,808k	£2,011k	£2,212k	£2,410k	£2,605k	£2,797k	£2,987k	£3,174k	£3,359k	£3,542k	£3,722k	£3,901k	£39,154k

Figure 29- Results RIA 2015- 2030

6. Stakeholder Feedback

6.1 Stakeholder Communication

As part of the project stakeholder workshops were undertaken on the 26th February and the 29th April. A list of the stakeholders that attended the workshop together with the agenda and slide presentation is included in Appendix II of this report.

Further feedback was given by individual organisations following the workshop. These contributions, together with feedback from the workshop, are presented below.

6.2 Stakeholder Feedback

Feedback from the stakeholder workshops and subsequent correspondence have been summarised into the five following sections:

6.2.1 Data Accuracy

At the initial workshop individuals representing material organisations had concerns with the data accuracy of the draft recycling rates for Scottish packaging materials. At the workshop only headline (total) recycling rates were discussed, not those of consumer or non-consumer streams. There was a general consensus that more work had to be undertaken to get reliable Scottish data for the quantity, material and format of packaging going on to the Scottish market and being collected for recycling. Following further work, follow-up conversations based on revised Scottish packaging flow and recycling data were held with material organisations (alupro, British Glass and RECOUP), including a breakdown by beverage containers. The revised figures were presented at the second workshop and there was general agreement from the stakeholder group that the figures represent the best currently available

6.2.2 Current System

Many organisations at the workshops were concerned that the system was potentially changing and felt that the current UK system provided the lowest cost solution and achieved EU targets, so there was no significant reason to change it. They highlighted that was significant changes already occurring within the waste system in Scotland that would drive up recycling rates and quality and that EU targets could be achieved without further intervention.

They also highlighted the increased costs they believed would be incurred by business and the difficulties that would occur in trying to estimate the quantity of material being placed specifically on the Scottish market. The potential for fraud was also highlighted should the Scottish PRN have a significantly different value to the UK PRN. However it was agreed that this would be minimised if a suitable audit trial and edoc system was implemented.

6.2.3 Litter Fund

The litter fund concept was generally accepted at the workshop. It was suggested that the litter fund could be placed at the collection point and could also be part of the overall PRN fund and replace Consumer Information Obligations. The potential for the fund to reduce year on year as recycling rates went up was also welcomed.

However there were private discussions with individual organisations expressing concern that they would prefer a voluntary agreement for litter rather than an imposed fee.

6.2.4 Carbon Rating

The idea of a carbon rating for reprocessors was met with a degree of scepticism as to how feasible it would be to implement and the additional cost that it would incur. It was agreed that it would achieve the best available environmental option for recycled material. However, it was considered to be gold plating and not necessary prior to achieving higher recycling rates.

6.2.5 Collection Impact

The impact on local authorities and private waste collectors was discussed and private waste management companies considered that what was initially proposed (compliance schemes purchasing material from the collectors and placing it at end market, similar to the WEEE compliance regime) was not desirable. However concern was expressed that the current system for packaging disadvantaged rural collections and that any new system should provide some cost support to rural authorities to encourage a wider range of material being collected by rural authorities. The revised system of a fixed fee at the collection point based on being accredited with SEPA and meeting quality criteria was generally accepted as a positive development and in line with Scottish Governments efforts to improve material quality.

7. Implementation

The implementation requirements and the timeline for introducing a Scottish PRN system are outlined in the following sections.

7.1 Infrastructure

As the system is an extension of the current PRN there would be no additional infrastructure requirements. The monitoring point introduced at the collection point would be covered be existing weighing equipment and the e-doc system being introduced to provide an audit trial for waste. There would therefore be no implementation requirement for infrastructure.

7.2 Legislative Amendments

As the proposed Scottish PRN system would remove obligation from the UK system and place it within a Scottish reporting system this will require an amendment to the primary legislation of the Environment Act 1995. It is anticipated that any change in primary legislation will take a minimum of 2 years to go through the parliamentary process. However if the obligation remains within the UK obligation with Scottish reporting introduced as an additionality it is believed that a change in primary legislation will not be required.

7.3 Administration

There are four areas that would have greater administrative burden as a consequence of introducing a Scottish PRN system. These four areas are:

- Local Authority Monitoring
- Reprocessor Registration
- Business Reporting
- Carbon Rating

The implications of each of these areas are discussed in more detail.

Local Authority Monitoring

As a consequence of a monitoring point for the production of collection evidence there will be a need for a local authority to implement a quality management system. Also similar End of Waste Criteria protocols on the quality requirements would have to be agreed between stakeholders. It is envisaged that the introduction of protocols and quality management system should take no longer than a year.

Reprocessor Registration

Currently a reprocessor or exporter only has to register with one of the Environment Agencies related to their location in the UK. If reprocessors can issue Scottish PRNs as well as UK PRNs this would require reprocessors to register with SEPA and another Environment Agency. This will introduce a delay into the implementation as reprocessors fill in the necessary administration with SEPA.

Local authorities and private waste management companies would also require to be accredited to issues collection notes this would introduce a further delay to the implementation of the system.

There have been situations in the current PRN market where if the PRN price is too low some smaller reprocessors have opted not to go through the registration process. This also may occur with the SPRN if there is not sufficient volume of Scottish packaging material being handled by the reprocessor. Therefore the administrative burden of registration should be minimum.

Business Reporting

As previously stated many businesses do not report their Scottish sales figures separately. IT systems would have to be adapted to report the information. For large producers this requirement will take several months to implement.

Carbon Rating

If a carbon rating of reprocessors were introduced, this would have to be introduced for retrospective data. Therefore there would have to be at least a year's delay in implementation of this so that data could be gathered by the reprocessor.

7.4 Timeline

Based on the administrative demands of implementing a SPRN system, it is estimated that the basic system without the carbon rating, could be implemented within two years, assuming that it passes through UK and Scottish parliament within this timeframe. However if the SPRN is implemented on top of the current system then the timeline would be reduced significantly. To introduce the carbon rating a further six months to a year will be required for implementation.

8. Conclusions

Based on the information gathered for this report and stakeholder workshops and interviews the following conclusions can be made:

1. It is feasible to introduce a SPRN system, however if the first five years the overall costs of introducing the system would outweigh the benefits. The system can be adapted from the existing UK wide PRN system with an additional monitoring point at collection so that an audit trail of Scottish material can be established. By expanding the current system to incorporate the principles of Extended Producer Responsibility a fund can be created to support the collection of litter or a litter awareness campaign. However the timeline for the introduction of this system is a minimum of two years with an amendment to primary legislation required if the obligation was removed from the UK system. However if it is implemented on top of the current system this two implementation could be reduced significantly.

2. From the Regulatory Impact Assessment (RIA) the best available option from a social, environmental and economic perspective is to adopt a voluntary participation option. However this is based on the assumption that it would deliver the increased recycling rates achieved through a full implementation of the proposed system.

3. Over a five year period (2015-2020) of analysis the “Voluntary Participation” option has the highest net benefit and this is followed by keeping the “Current System”. These benefits are calculated based on the assumptions detailed in the report. However over a ten year period (2015-2025) the “Full Implementation” option has a higher net benefit than keeping the “Current System”, although “Voluntary Participation” still has the highest net benefit over this period.

4. To achieve UK recycling levels, and the potential higher targets being set by the European Union, other formats of packaging will be required to be targeted in addition to beverage containers. Currently, collection levels of Pots, Tubs and Trays are very low and these formats need to be included as specific targets in any compliance system.

5. The principles of the SPRN system or a Scottish reporting and voluntary system can be extended to include further material streams, in particular other packaging formats or materials that are present within the consumer stream, have low residual value and are disposed of currently to landfill. In particular items like non-clothing textiles, footwear, mattresses and carpets.

Appendix I

Summary of UK & Scottish Flow Data

		2012 Data							
		UK			Scotland				
ALL PACKAGING	Packaging Material	Flow on = PackFlow Ave Flow (t)	Recycling (t) = NPWD 2012	Recycling (%)	Flow (t) = Sum of C & NC	Recycling (t) = Sum of C & NC	Ave Recycling (%)	% UK Flow that is Scottish	% UK Recycling that is Scottish
	Aluminium	150k	62k	42%	13k	5k	39%	8.5%	7.8%
	Paper & Card	3816k	3321k	87%	330k	280k	85%	8.6%	8.4%
	Glass*	2399k	1627k	68%	229k	125k	55%	9.6%	7.7%
	Plastics	2587k	644k	25%	219k	52k	24%	8.5%	8.0%
	Steel	649k	357k	55%	56k	27k	48%	8.6%	7.4%
	Wood	1119k	525k	47%	98k	46k	47%	8.7%	8.7%
	TOTAL	10719k	6536k	61%	944k	534k	57%	8.8%	8.2%
CONSUMER (C)		EPIC Scaled up UK Flow (t)	Recycling (t) =WDF Collections 2012/13	Recycling (%)	Flow (t) = 8.3% of UK Flow	Recycling (t) = WDF 2012/13	Ave Recycling (%)	% UK Flow that is Scottish	% UK Recycling that is Scottish
	Aluminium	101k	49k	48%	8k	4k	44%	8.3%	7.6%
	Paper & Card	1043k	854k	82%	87k	65k	75%	8.3%	7.7%
	Glass	1798k	1318k	73%	179k	99k	55%	10.0%	7.5%
	Plastics**	1768k	440k	25%	147k	34k	23%	8.3%	7.7%
	Steel	286k	202k	70%	24k	13k	54%	8.3%	6.4%
	Wood								
	TOTAL	4997k	2862k	57%	446k	215k	48%	8.9%	7.5%
NON-CONSUMER (NC)		UK Total Flow (PackFlow Ave) - UK Consumer Flow (Epic Scaled up)	Recycling (t) =Residual	Recycling (%)	Flow (t) = 8.7% of UK Flow	Recycling (t) = 8.7% of NPWD 2012 - WDF 2012/13	Ave Recycling (%)	% UK Flow that is Scottish	% UK Recycling that is Scottish
	Aluminium	49k	14k	28%	4k	1k	28%	8.7%	8.7%
	Paper & Card	2773k	2467k	89%	243k	215k	89%	8.7%	8.7%
	Glass*	601k	309k	51%	50k	27k	54%	8.3%	8.7%
	Plastics	819k	204k	25%	72k	18k	25%	8.7%	8.7%
	Steel	362k	155k	43%	32k	14k	43%	8.7%	8.7%
	Wood	1119k	525k	47%	98k	46k	47%	8.7%	8.7%
	TOTAL	5723k	3674k	64%	498k	320k	64%	8.7%	8.7%

*UK and Scottish glass flow figures taken form Valpak & WRAP's GlassFlow report

** UK & Scottish Plastics Recycling figures provided by Recoup from their LA Plastics Collection Survey work, 2012

Appendix II

Stakeholder Attendees and Agenda

Workshop 26th February – Delegate List

Organisation	Delegate Name
Alupro	Rick Hindley
Asda	Karen Todd
Ball Packaging Europe	Noman Lett
Barony Universal	Gary Dickson
British Glass	Rebbeca Cocking
Coca-Cola Enterprises	Paul Smith
Compliance Link	Edward Cooke
COSLA	Rona Gold
Dryden Aqua Ltd	Andrew Pooley
Keep Scotland Beautiful	Carole Noble
Keep Scotland Beautiful	Derek Robertson
Marks & Spencer	Asta Volkauskiene
Recycle-Pak Scotland Ltd	Katherine Newall
Scotch Whisky Association	Morag Garden
Scotpak	Simon Stringer
Scottish Beer and Pub Association	Patrick Browne
Scottish Environmental Services Association	Stephen Freeland
Scottish Grocers Federation	John Lee
Scottish Retail Consortium	David Martin
SEPA	Fiona Donaldson
SEPA	Nathaniel Chalamanda
The Environment Exchange	Ian Andrews
The Packaging Recycling Group Scotland	Ian Shearer
The Wastepack Group Limited	Paul Van Danzig
Valpak	Adrain Hawkes
Valpak	Duncan Simpson
Veolia Environmental Services (UK) Plc	Chris Sedgley
Viridor Resource Management Ltd	Graeme Milne
Viridor Resource Management Ltd	Tony Hill
William Tracey Group	Peter Judd
Wright Glass Recycling	Matthew Demmon
Zero Waste Scotland	Damian Ramos

Workshop 26th February – Agenda

Time	Item	Presenter
09:30 – 10:00	Registration and Coffee	
10:00 – 10:05	Introduction to the Workshop	Andrew McCaffery
10:05 – 10:25	Scottish Flow of Packaging Material	Heather Thomson
10:25 – 10:45	PRN Model	Duncan Simpson
10:45 – 11:05	Coffee Break	
11:05 – 11:30	Proposed Scottish PRN	Andrew McCaffery
11:30 – 12:15	Workshop	All
12:15 – 13:00	Feedback and Discussion	Group Leaders/All
13:00 – 13:15	Next steps and Close	Andrew McCaffery

Workshop – 29th April 2014 – Delegate List

Contact Organisation	Contact	Title
Alupro	Rick Hindley	Executive Director
Compliance Link (SEPA)	Edward Cooke	Director
Edrington	Sarah Dowling	Attending on behalf of Morag Garden
Scotpak (SEPA)	Simon Stringer	
Scottish Environmental Services Association	Stephen Freeland	Policy Executive
Scottish Retail Consortium	David Martin	Head of Policy & External Affairs
SEPA	Bill Scott	
SEPA	Nathaniel Chalamanda	Regulations
The Environment Exchange	Ian Andrews	Senior Market Operator
Veolia Environmental Services (UK) Plc	Chris Sedgley	Packaging Compliance Scheme Manager
Viridor Resource Management	Graeme Milne	
Viridor Resource Management	Tony Hill	Logistics Accounts Manager
William Tracey Group	Peter Judd	Sales Manager

Workshop 29th April 2014 – Agenda

Time	Item	Presenter
14.00-14.15	Registration & Coffee	
14.15-14.30	Introduction to Project & Report	Andrew McCaffery
14.30-15.00	Scottish Flow of Packaging Material	Heather Thomson
15.00-15.30	Proposed Scottish PRN System	Andrew McCaffery
15.30-15.45	Coffee Break	
15.45-16.05	Results of the Regulatory Impact Assessment	Gordon Francey
16.05-16.30	Conclusions & Close	Andrew McCaffery