

Colm Lambert (DECC)

From: [REDACTED]
Sent: Friday 7 May 2021 17:29
To: wastecomments
Cc: [REDACTED]
Subject: CONSULTATION RESPONSE TOMRA: Deposit Return Scheme: Legislative framework and scope of the scheme
Attachments: What-We-Waste-Reloop-Report-April-2021-1.pdf; 20201112_Ireland_Consultation_Response_Final_TOMRA.pdf; 210507_Consultation Response on legislative framework and scope of the scheme_TOMRA.pdf
Importance: High

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Dear Sir or Madame,

Please find attached the consultation response on the legislative framework and scope of the scheme, TOMRA's consultation response on potential DRS models for Ireland including more detailed information, as well as supporting documents.

Please do not hesitate to contact me in case further information or clarifications are required.

Best regards,

[REDACTED]
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Governmental Affairs Europe & Central Asia

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LEARN THE 4 R'S OF WASTE SOLUTION

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Rialtas na hÉireann
Government of Ireland

Deposit Return Scheme

Consultation Document on Potential Models for Ireland

2 October 2020

1 Introduction

The Programme for Government – Our Shared Future – and the Waste Action Plan for a Circular Economy set out the Government’s commitment to introduce a Deposit and Return Scheme (DRS) for plastic bottles and aluminium cans.

The milestones in establishing a DRS are as follows:

1. Public consultation on design options (now);
2. Public consultation on preferred model and draft regulations (Q1 2021);
3. Commencement of underpinning legislation (Q3 2021);
4. Introduction of scheme (Q3 2022).

This document is the consultation paper on design options set out at 1 above. In it, we describe a number of potential DRS models that could operate in Ireland. Alongside this consultation paper, the Department of the Environment, Climate and Communication is also publishing a report it commissioned from Eunomia Research and Consulting to analyse options for Ireland to increase its capture of plastic bottles and aluminium beverage containers (referred to throughout this paper as ‘the DRS study’).

To facilitate a structured response, the paper poses some questions for consideration. Respondents are not required to respond to all questions and are free to raise other relevant points. All submissions are welcome and will be considered in developing the new Deposit and Refund Scheme.

Submissions can be made to the following e mail address:

Wastecomments@DCCAE.gov.ie

The closing date for submissions is **5pm, Thursday 12 November, 2020.**

Responses to this consultation are subject to the provisions of the **Freedom of Information Act 2014 and Access to Information on the Environment Regulations 2007-2014**.

Confidential or commercially sensitive information should be clearly identified in your submission, however parties should also note that any or all responses to the consultation are subject in their entirety to the provisions of the FOI Acts and will be published on the website of the Department of Communications, Climate Action and Environment.

By responding to the consultation, respondents consent to their name being published online with the submission. The Department will redact personal addresses and personal email addresses prior to publication. We would draw attention to the Department's privacy statement:

'The Department of the Environment, Climate and Communication requires responders to provide certain personal data in order to provide services and carry out the functions of the Department. Your personal data may be exchanged with other Government Departments and Agencies in certain circumstances, where lawful. Full details can be found in [our Data Privacy Notice](#).'

2 What is a DRS?

Deposit and return schemes have been around for decades and were originally designed by the beverage industry as a way of ensuring the return of bottles to be washed, refilled and resold. In Ireland, some people will recognise this as a system that was previously used to ensure that milk and soft drinks bottles were returned for reuse.

A DRS for beverage containers therefore involves the application of a refundable deposit to incentivise consumers to return their beverage containers for recycling or reuse. While the primary function of a DRS is to increase recycling rates and support the circular economy (by keeping materials in productive use and securing the resource value of existing materials and reducing demand for new materials), in some countries they have also been shown to assist in the reduction of littering of beverage containers.

As set out in the DRS study, generally the system works as follows:

- Beverage producers initiate the deposit by paying it into a deposit account;
- Retailers pay the deposit to producers/ distributors at the wholesale stage;
- Consumers pay the deposit to retailers, along with the price of the beverage;
- Consumers claim a full refund when they return their used beverage container to a designated return location;
- The return location is reimbursed for the refunded deposit from the deposit account; and
- The returned used beverage containers are transported to be processed and recycled. The material can be used to manufacture new containers.

A DRS can be voluntary (e.g. industry-led) or statutory (mandated by legislation). Many other EU Member States have DR systems in place already and others are planning or considering the introduction of a DRS.

3 How are plastic bottles and cans collected at present?

In Ireland, the main route through which plastic bottles and aluminium drinks cans are currently captured is kerbside collection. Most households (approx. 80%) in Ireland are served with kerbside collections in either a two-bin or three-bin service – one bin for mixed dry recycling (MDR), one for mixed residual waste (MRW) and in many areas also a food/organics bin (the provision of food/organics bins to households in every town with 500 or more residents is now mandatory). Beverage containers (plastic and aluminium) are therefore collected in the MDR bin alongside other household packaging, paper and card. Complementing kerbside collection, there is a network of 1,848 locations where beverage containers can be brought for recycling. In addition to providing a convenient drop-off location for some households, these are likely to capture just a small proportion of beverage containers consumed and disposed ‘on-the-go’.

4 Why do we need a DRS?

There is a number of reasons why we need a DRS but put simply, too few plastic bottles and cans are being captured for recycling by our current system and too many are being discarded as litter.

We are falling short of the required levels of recycling. The Single Use Plastics Directive sets a collection target of 90% for plastic bottles by 2029 with an interim target of 77% by 2025. The DRS study shows that we are currently achieving an estimated 55% separate collection for Polyethylene Terephthalate bottles (PET) and aluminium beverage cans, leaving us behind the 2025 target and well short of our 2029 target. . The SUP Directive also requires that PET beverage bottles contain at least 25% recycled plastic by 2025 and that all plastic beverage bottles contain 30% by 2030. A well operated DRS is capable of producing high quality food grade recyclate which can be used by beverage manufacturers to meet these recycling content targets.

While a number of Member States do so, there is no specific EU obligation to operate DRS. Article 9 of the Single Use Plastics Directive includes the establishment of DRS as a means by which Member States may seek to achieve the targets.

However, the DRS study concludes that there is no evidence to suggest that the current system could be enhanced to reliably achieve a 90% separate collection rate and that a DRS is considered to be the only feasible way to achieve the 90% target.

In terms of litter, litter from packaging (which includes bottle caps, plastic bottles and cans) is a problem in Ireland, accounting for 18.2% of litter. Coastwatch estimates that plastic bottles and aluminium cans are among the top five marine litter items. While there are direct clean-up costs associated with littering, the report published alongside this consultation document shows that littering has a significant disamenity value on communities. The DRS study estimates that a DRS could reduce this disamenity value by €95m and reduce littering by 85%.

The DRS study also provides estimates of potential avoided materials loss and the value of avoided greenhouse gas emissions that could be delivered through the introduction of a DRS. With a 90% return rate, a DRS could reduce the tonnage of deposit-bearing containers that are landfilled or incinerated by 88%. The consequent reduction in greenhouse gas emissions in a year is valued at €1.83 million, with the annual reduction in other air pollutants valued at €550,000.

5 What will a DRS mean for consumers?

As set out above, a DRS for beverage containers involves the application of a refundable deposit to incentivise consumers to return their beverage containers for recycling or reuse. Consumers will pay a deposit that will apply to relevant plastic or aluminium beverage drinks containers. It is suggested that consumers will pay a deposit of €0.20 at the point of purchasing a beverage contained in a plastic bottle or aluminium can. This deposit will be redeemed when the empty container is returned. This creates an incentive for consumers to return empty containers – provided they return their empty container, there is no charge.

The specific methods for refund can vary but are generally cashless.

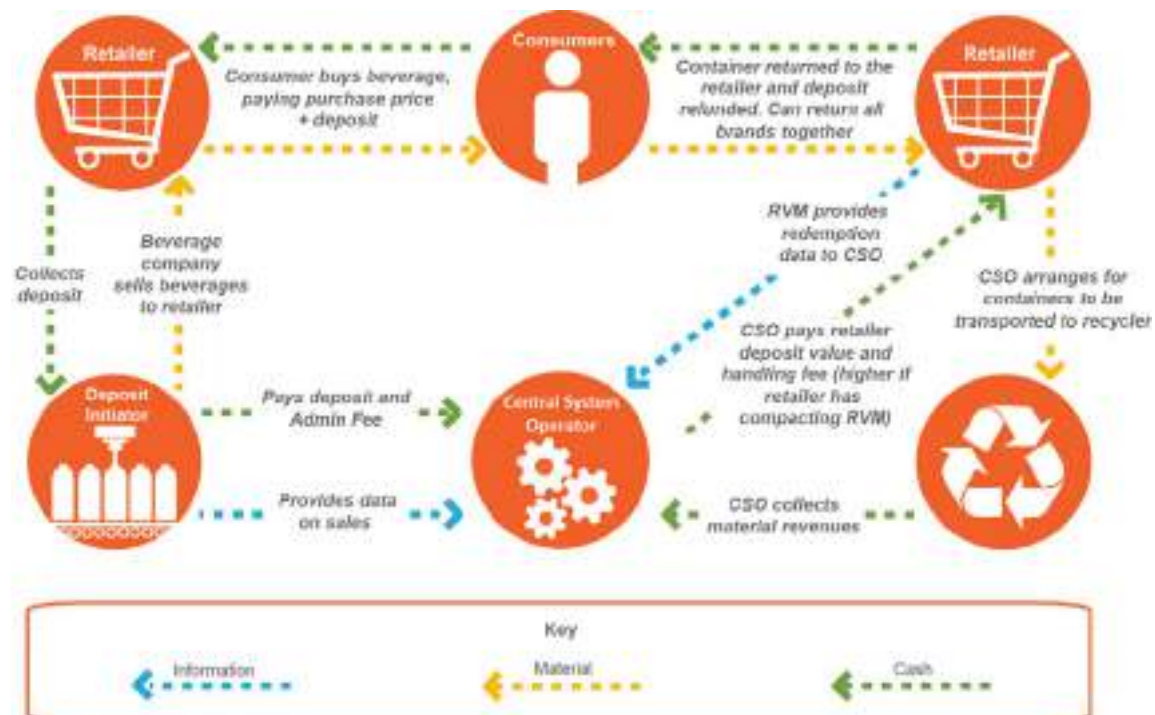
6 What beverage containers will be included in scope of the DRS?

As set out in the *Waste Action Plan for a Circular Economy*, the scheme will apply to:

- PET plastic beverage bottles (up to 3 litres volume) and;
- aluminium beverage cans.

It will not apply to glass bottles or composite beverage containers such as Tetrapak/Elopak. It will also not apply to plastic milk cartons due to the risk of contamination.

7 How would a DRS operate?



A DRS is a form of extended producer responsibility (EPR). Under an EPR model, producers take over the responsibility for collecting or taking back used goods and for sorting and treating for their eventual recycling. Ireland successfully uses the EPR model for dealing with

a number of waste streams. EPR systems based on the 'producer pays' principle already operate in Ireland in the following waste streams:

- Waste Electrical and Electronic Equipment (WEEE);
- Batteries;
- Packaging;
- End of life vehicles (ELVs);
- Tyres;
- Farm plastics.

A DRS for plastic bottles and aluminium beverage cans is a form of EPR and, as with other EPR systems in Ireland, it has been decided that the operation of the DRS will be statutorily mandated.

It will also operate on the basis that relevant containers can be returned to any place of purchase which is participating in the Scheme. Consumers could take their empties back to any participating beverage retailer – not just the retailer from whom the beverage was purchased.

Within these parameters, there are a number of options for how a DRS could work.

These fall into 3 main categories:

1. Centralised or operational DRS
2. Decentralised or financial DRS.
3. Hybrid of 1 & 2.

A brief description of each model is set out below. The DRS study indicates that the model chosen significantly impacts on results.

As set out above, whichever model is ultimately chosen, the scheme would be supported, as other EPR models are, by specific secondary legislation or regulations. These regulations may provide or set out:

- The level of the deposit;

- That producers are being tasked with responsibility for establishing a DRS and operating it on a financially sound basis;
- The process whereby a scheme operator is to be appointed by the Minister (including the application process and matters to which the Minister would have regard in appointing a scheme operator);
- The specific obligations to be placed on the scheme operator in terms, for example, of collection rates and quality or contamination standards to be delivered;
- Specific obligations to be placed on other operators across the system
- The awareness raising and educational responsibilities of the scheme operator;
- Penalties for failure to meet obligations.

7.1 Centralised or operational DRS

Centralised schemes are producer owned and led.

In the case of a DRS in Ireland for plastic bottles and aluminium drinks cans, this means that a centralised scheme would be owned and led by drinks producers placing their products on the Irish market in beverage containers within the scope of the scheme. Producers could establish their own scheme operator or seek to partner with an approved scheme under an existing EPR.

Centralised schemes are generally underpinned by legislation which provides for a means of Government authorisation of a scheme that is then mandated to achieve specific performance targets in terms of separate collection and recycling of plastic bottles and aluminium cans. A centralised or operational model operates on the basis of a central budget which is held by the DRS body or scheme operator (for example, think Repak in terms of packaging, or WEEE Ireland / ERP in terms of WEEE). Drinks producers would be required to become members of and fund the DRS.

The scheme operator sets producer fees and is directly responsible for managing the collection, sorting, treatment and sale (for recycling) of the materials collected. Producers are essentially then charged on the basis of numbers of units placed on the market, in line with the polluter pays principle. The scheme operator also takes on responsibility for

providing return infrastructure in the form of Reverse Vending Machines (RVMs) at larger retail outlets and manual take back at smaller outlets (i.e. those that do not have the physical space to accommodate RVMs).

As with other EPR models the scheme operator would also be mandated, as part of a Ministerial approval process, with responsibility for awareness raising and education for businesses and wider society around the general operation of the DRS itself, the objectives it is required to achieve and the environmental importance of attaining these. So, for instance, the scheme operator would be responsible for ensuring that consumers understand the system and, in particular, that the deposit paid at the point of purchase is fully refundable and avoid a sense that the deposit is a price increase.

Similarly, the scheme operator would also be required to publish annual reports and accounts, including details of membership, governance, performance and educational / awareness raising activities.

Across the EU, this is the most common form of DRS.

7.2 Decentralised or financial model

Under a decentralised or financial system, the DRS scheme operator plays a more limited role – although the same obligations in relation to awareness raising and education, annual reports and accounts, governance etc would apply.

While a decentralised scheme would also be given legislative underpinning, responsibility for target attainment is given to producers generally. Operational responsibility is then left to other stakeholders, such as collectors, and these other stakeholders receive financial support from the scheme operator to fund their activities under the scheme.

Unlike the centralised or operational model, the scheme operator does not take ownership of the material. Typically producers will collect their own containers or will contract out collection of their own containers, so that there can be multiple collectors and different

systems under a decentralised system. Returned beverage containers are sorted and stored separately by producers.

The sharing of responsibilities under a decentralised system means that overall governance and accountability is shared by the scheme operator, producers, collectors and retailers. Responsibility for awareness raising and outreach may also be shared rather than held by a single entity as under the centralised model. The responsibility on each operator across the system in this model would be laid out in legislation.

7.3 Hybrid

A hybrid model brings in aspects of both the centralised and decentralised models. Financial management of DRS would rest with the scheme operator with the operational delivery – collection and recycling – contracted by the scheme operator to collectors and municipal recycling facilities (MRFs). Once again, the obligations outlined above in relation to awareness raising and education, annual reports and accounts, governance etc would apply.

As under the decentralised model, the scheme operator does not take ownership of the material. Instead, this resides with the waste operators (collectors / MRFs).

Whereas under the decentralised model producers collect their own containers or will contract out collection of their own containers, in the hybrid model waste collectors would collect all producers' beverage containers.

8 Consultation questions:

- The Report recommends a centralised, operational model for Ireland. Do you agree with this recommendation?
- If not, do you favour a:
 - a) decentralised / financial DRS; or,
 - b) hybrid.
- Are there other models you believe could work in an Irish context?
- What role should waste collectors play in the operation of a DRS?
- The DRS study proposes a deposit per container of €0.20. Do you think this is appropriate? If not should it be higher or lower or should different deposit rates apply depending on container size?
- Consumers need to know about a DRS long before it becomes operational – do you have any suggestions as to how best the introduction of a DRS can be communicated to the public?
- What enforcement measures should be considered in parallel with the introduction of a DRS?
- How should cross-border issues be treated to ensure producers are not at a competitive disadvantage relative to producers in Northern Ireland?

**Deposit Return Scheme
Consultation Response on Potential Models for Ireland**



Date: 12 November 2020

Respondent Name: TOMRA SYSTEMS ASA

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1. About TOMRA

TOMRA was founded on an innovation in 1972 that began with the design, manufacturing and sale of reverse vending machines (RVMs) for automated collection of used beverage containers. Today TOMRA provides technology-led solutions that enable the circular economy with advanced collection and sorting systems that optimise resource recovery and minimise waste in the food, recycling, and mining industries.

With an installed base of approximately 83,000 systems in over 60 markets, TOMRA Reverse Vending is the world's leading provider of reverse vending solutions. Every year TOMRA facilitates the collection of more than 40 billion empty cans and bottles and provides retailers and other customers with an effective and efficient way of collecting, sorting and processing these containers.

In addition, TOMRA creates sensor-based technologies for sorting and process analysis within the recycling, mining, food and other industries. With more than 13,740 installations worldwide, TOMRA Sorting Solutions offers a unique range of complementary sorting technologies, the most extensive service base, and the widest geographic and market segment coverage in the industry. Subsequently, TOMRA is a global leader in its field and has pioneered the automation of waste sorting. Its flexible sorting systems perform an extensive range of sorting tasks and are able to both prepare and sort various types of metals and waste for either material recycling or energy recovery. Currently TOMRA Sorting Recycling has an installed base of close to 5,960 units across more than 40 markets.

The information contained in this consultation response represents TOMRA Systems ASA's extensive experience, opinion, approach and attitude towards the establishment of a modern, cost efficient Deposit Return System (DRS) for single-use beverage containers.

2. DRS in the framework of a Circular Economy:

Within the framework of the Circular Economy, a Deposit Return System (DRS) is the most suited and efficient economic instrument when aiming to achieve full circularity for beverage containers. Besides being the only solution able to fulfil the Extended Producer Responsibility (EPR) obligations for close to 100% of the products sold to the market, it is also the best application of the polluter pays principal.

A well designed, modern, efficient DRS is thereby able to:

1. Achieve high collection and recycling rates above 90%¹
2. Guarantee a stable feedstock and supply of high quality secondary raw materials for the domestic processing and recycling industry, which can subsequently be integrated into new products (bottle-to-bottle)
3. Achieve an instant reduction of terrestrial and marine litter, particularly for those beverage containers consumed on-the-go

¹ European collection rate average for PET bottles in the 10 existing European DRS is >90%

The overall aim of any DRS should be:

1. Maximising the quantity and quality of the targeted materials when it comes to collection, sorting and high-quality recycling
2. Preventing terrestrial and marine litter
3. Easy access for the consumer
4. Running at the lowest possible cost for all stakeholders involved thereby achieving maximum economic and environmental benefits
5. Fulfilling the Extended Producer Responsibility (EPR) obligation

However, no two existing deposit systems are identical - local culture, industry structure and political objectives form the system. The system needs to be adapted to the existing environment in which it shall operate. TOMRA has built on more than 48 years of experience in the field of DRS (single use/refillable) concluding 12 key elements, which are recommended to be included in a modern cost efficient DRS, in order to achieve the above desired key results:



It is important to note that when talking about a DRS for single-use beverage containers, a clear legal framework needs to be set by the government. A voluntary approach without legislative basis has shown that the desired results will not be achieved. Therefore, all globally existing DRS are mandated by law.

Voluntary DRS are traditionally implemented for refillable bottles.

3. Consultation Questions

Question 1 + 2:

The Report recommends a centralised, operational model for Ireland. Do you agree with this recommendation? If not, do you favour a) decentralised / financial DRS; or, b) hybrid

Yes. Experience shows that best results in terms of economic and environmental efficiency, as well as prime transparency, are accomplished if the DRS is managed by a centralised non-profit organisation, mutually owned by the obligated stakeholders from beverage industry/importers and retail. It is today the most effective way to reach maximum equality, system integrity, transparency, and efficiency within the system.

As part of their Extended Producer Responsibility (EPR) obligation, the stakeholders must bear the investment and running costs of the system. As a consequence, these stakeholders are the legal owners of the DRS management organisation.

This needs to be mandated by law. The appointment of the Central System Operator is concluded by the respective regulatory body (Ministry of Environment or EPA) after a public tendering process.

The main benefits of a centrally administered and operated DRS can be summarised as follows:

- Economies of scale
- Prevent free riding
- Ease for consumers
- Better for public education
- Transparency
- System integrity
- Reduced complexity
- Level playing field

However, there are also differences in the set-up and efficiency of centrally organised systems. Therefore, the focus should be on the Nordic, in particular Norway, as well as the Baltic systems, such as Lithuania and Estonia².

Composition of Central System Operator:

The Central System Operator is traditionally composed of representatives from the beverage industry/importers and retail.

The reason being:

- The beverage industry is responsible for fulfilling its EPR obligations, preferably at the lowest possible cost.
- The beverage industry is responsible for financing the system.
- Retailers are very often drinks producers themselves (white brands).
- Retailers are responsible for establishing an efficient and accessible collection infrastructure in order to achieve the desired legally binding collection targets.
- Retailers receive a “handling fee” per empty beverage container collected. This handling fee shall cover the direct costs [means of collection (RVM/Manual), loss of space, time dedicated

² It is important to note that Scotland (DRS will start on 1st July 2022), based its future DRS on Norway and Latvia (DRS will start on 1st February 2022) based its future DRS on Estonia and Lithuania.

to maintenance, cleaning, coverage of electricity and internet costs] associated to the collection of these containers.

As producers need to pay an “Administration Fee” for each unit sold into the market, the aim is for this Administration Fee to be as low as possible.

As retailers receive a “handling fee” per unit collected, the aim is for this handling fee to be as high as possible. Not only does the handling fee represent the highest cost for the DRS, but as the Administration Fee, as well as the handling fee need to be readjusted periodically, it makes sense to have both stakeholders represented on the management board of the system. Most commonly this is done through the respective associations.

Yet, it does not necessarily mean that the shares are distributed equally, this distribution can vary from system to system.

Estonia:

Eesti Pandipakend OU (EPP)

- 25% Association of Producers of Soft Drinks
- 25% Estonian Association of Brewers
- 25% Association of Importers of Soft Drinks and Beer
- 25% Estonian Retail Association

Lithuania:

Užstato Sistemos Administratorius (USAD)

- Lithuanian Brewers Association
- Association of Lithuanian Trade Enterprises
- Lithuanian Natural Mineral Water Manufacturers’ Association

Norway:

Infinitem

- 7.5% Grocery Manufactures’ Service Office
- 33.5% Norwegian Association of Wholesale Grocers
- 15% Coop Norway
- 1.5% Norwegian Federation of Petrol Dealers
- 35% The Norwegian Brewers’ Service Office
- 7.5% Federation of Norwegian Food and Drink Industry

Central System Operator responsibilities:

The Central System Operator is responsible for coordinating and executing an efficient and transparent money-material flow within the system.

Efficiency through Central Organisation



1. Data management, deposit clearing and reporting

- a. Collection of deposit from producer
- b. Collection of Administration Fee from producer and retailer where applicable
- c. Aggregation of sales data from producers
- d. Aggregation of collection data from automated and manual collection sites
- e. Clearing of deposits across the different levels of trade
- f. Administration/payment of handling fees (see Appendix for detailed description) to retail
- g. Matching sales and collection data
- h. Fraud monitoring/management
- i. Reporting to competent body (Government) of achieved collection rates

2. Operation of logistics system

- a. Registration of new products/containers into the system
- b. Design/control the use of deposit labels
- c. Manage/design the flow of empty containers + clearing of deposits
- d. Approval/certification and quality assurance of manual collection procedures
- e. Approval/certification of collection equipment (RVMS, counting station equipment, bags, boxes etc.)
- f. Counting of manually collected containers
- g. Awarding of transportation and depot contracts
- h. Operation of counting/sorting centre

3. Marketing of collected material

- a. Negotiation of contracts/sale of collected material
- b. Quality assurance and product development

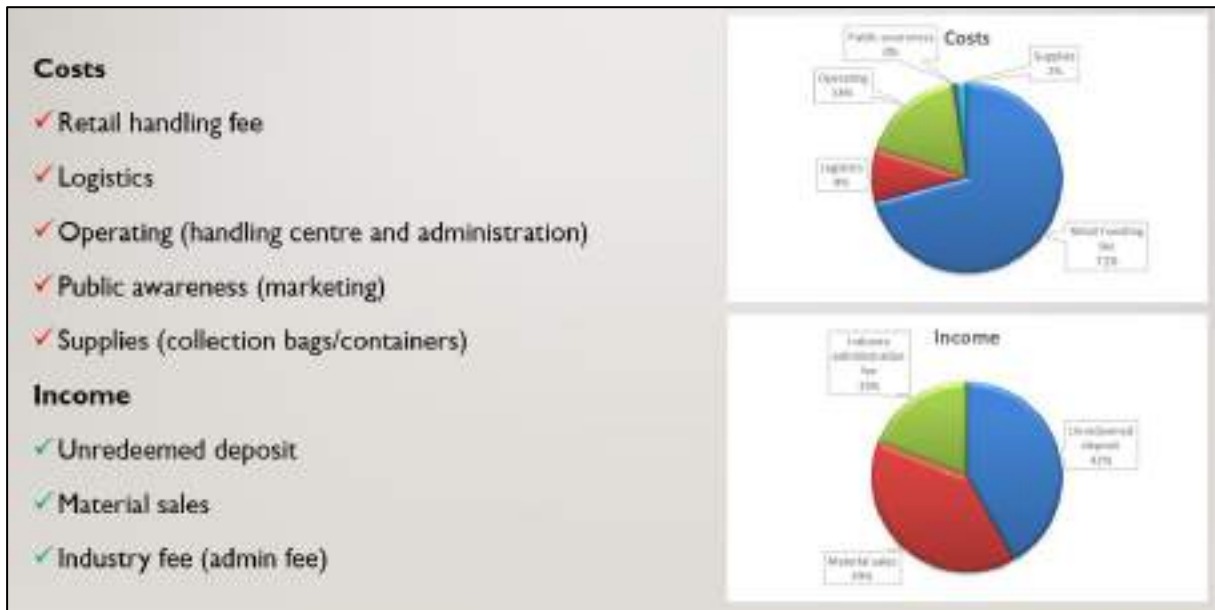
- c. Sorting and bailing of collected materials (preparation for recycling)
- 4. Marketing of deposit system towards the consumer
 - a. Continuous awareness building towards the consumer

System economics

1. An efficient DRS relies on three main income streams:
 - a. Unredeemed deposits
 - b. Producer/importer fee paid by the producer into the system
 - c. Sales of collected materials
2. As the DRS follows the not-for-profit principle:
 - a. Any economic profit made in the DRS is reinvested into the system to optimise existing costs
 - b. Profits are not paid out to the shareholders

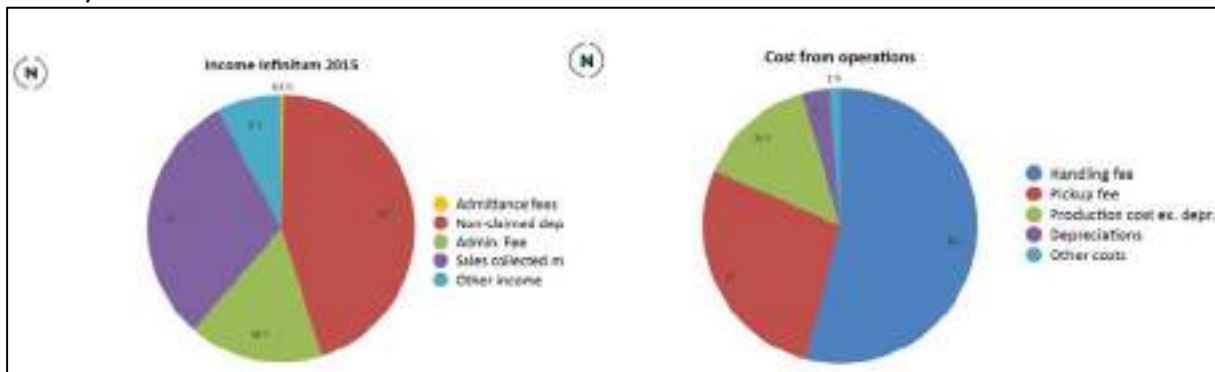
Deposit operator profit and loss calculation (P&L)		
Registration fee (annual/fixed)	=	
Administration Fee (per unit sold):	=	=
Sale of commodities/material:	=	
Unredeemed deposit (100% - R%):	=	
Finance/interest:	=	
Sum income:	= x	
Handling fees (to retail):	=	
Pick-up and freight:	=	
Administration/management:	=	
Operation of counting/sorting centre	=	
Marketing/Information/PR:	=	
Sum costs:	= y	
Net result (long term):	= x-y ~ 0	→ not for profit

Estonia:



Source: Eesti Pandipakend (EPP)

Norway:



Source: Infinitum

Lithuania:



Source: Užstato Sistemos Administratorius (USAD)

Question 3:

Are there other models you believe could work in an Irish context?

We are not aware of any other models that reach the desired environmental and economic outcomes.

Question 4:

What role should waste collectors play in the operation of a DRS?

Waste collectors and the wider waste management industry have the following operational opportunities available in a DRS:

- Logistics (collection and transport)
- Operation of counting and/or sorting centre
- Resource trading
- Recycling

Generally speaking, the traditional waste management sector has a vital role to play in creating a circular economy, in which DRS plays a crucial role. Compared to the traditional waste management approach, where collected materials are disposed of or incinerated at the end of their usage, the circular economy is aiming at the high quality and quantity collection and reprocessing of materials which are placed back into production lines, thereby representing an important and valuable feedstock for the recycling and manufacturing industry.

But what does this mean for the traditional waste management sector? First of all, it means a change in perception and mindset of how waste is being perceived, away from old patterns of consumption, discard and waste towards consumption, optimisation for recycling and reuse. Waste is composed of various high value resources. A resource is therefore nothing that should be simply discarded, but reprocessed and re-used as often as possible. As a consequence, industries need to adapt towards becoming materials and resource managers, rather than waste managers. However, in order to achieve this, high-quality collection needs to be maximised, as it is only possible to sort and recycle what is being collected.

Being a material and resource manager particularly the collection mechanisms, flow and handling of these valuable materials needs optimisation and innovative approaches, ideally using existing infrastructures. For a circular economy, the optimisation of existing transport chains and complex logistics and infrastructure networks is as crucial as the optimisation of waste collection, transport and handling. Recovering clean material fractions requires the separate collection of selected material streams which again entails new diverse business opportunities.

A good example is Remondis being one of the leading waste management companies in Europe. Today in Germany, Remondis is at the forefront when it comes to championing the manual return logistics. Their activities include reverse logistics, counting and sorting centre operations, processing and recycling. In addition, they also adapted their re-processing infrastructure and are a strong active player in the PET and glass recycling industry.

New infrastructures need to be established and existing ones expanded, such as recovery and reprocessing facilities, technologies and software in order to divert the valuables from the waste stream and re-supply industries with high quality materials which are put back into production.

Question 5:

The DRS study proposes a deposit per container of €0.20. Do you think this is appropriate? If not should it be higher or lower or should different deposit rates apply depending on container size?

TOMRA strongly supports the proposed deposit amount of 0.20€. Experiences from other DRS have shown that that the amount is sufficient to quickly reach collection and recycling rates above 90%. In case variable deposit amounts are applied it is recommended that the lowest deposit amount is 0.20€.

Experience from other markets show that the final decision on the appropriate deposit amount is taken by the government. However, the Central System Operator should have a say in advising the government on what is most appropriate. It is thereby important to keep various factors in mind:

- The deposit amount needs to have the right balance between being high enough to incentivise the consumer and being low enough to discourage fraud.
- The deposit amount needs to be aligned with the cost of living.
- The deposit amount needs to be aligned with the purchasing power.
- The deposit amount needs to take into account the inflation amount over time.
- The deposit amount needs be set at a rate that still motivates consumers to return containers 5-10 years from the year of introduction.
- The deposit should be excluded from any VAT.
- In order to avoid confusion among consumers and achieve system simplicity and cost efficiency, particularly in the system administration, it is recommended that the deposit amount is flat across all drinks containers included in the system. In addition:
 - Producers might switch to containers types with a lower deposit value, in order to avoid charging a higher deposit amount.
 - Producers face increased costs by applying different barcode for the same container type.

The deposit value is a key contributor for reaching the set collection targets.

Should the collection rates stagnate at a rate that is not desired, the Central System Operator should be able to propose and advise the government to increase the amount in order to reach higher collection results.

This approach was taken in Estonia in 2016, where the deposit amount was raised from 0.04€/0.08€ to a uniform 0.10€ which quickly resulted in a higher collection rate.

A similar approach was taken in Norway in 2018, where the deposit amount increased from 0.01NOK/0.025 NOK to 0.02NOK/0.03NOK.

Question 6:

Consumers need to know about a DRS long before it becomes operational - do you have any suggestions as to how best the introduction of a DRS can be communicated to the public?

Constant and ongoing communication campaigns play a key role in any DRS, particularly prior and during the start-up phase of the system. As the aim of any DRS is to achieve the highest possible collection and subsequent recycling targets for the targeted beverage containers, communication campaigns, next to the right deposit value, are a key contributor in achieving this. Not only is it important for the consumer to understand how the system works, but to also understand the benefits the system brings to the environment and society. The responsibility hereby lays with the Central System Operator, who is financially and operationally responsible for keeping society informed about the system and its benefits.

Planning a „Public Education Program“ over four distinct phases of the scheme, each with a set of key activities, can prove to be particularly effective. These phases include:

- Preparation
- Pre-launch
- Post-launch
- Ongoing campaign

Initial preparations should take place at least six months in advance of the DRS launch. These preparations will culminate in an intense period of media approximately four weeks before the scheme launch that will focus on boosting awareness of the DRS. Following the launch, there should be a further intense period of media and events that will continue to grow awareness and educate consumers. After this initial burst, additional campaigns can be used strategically and tactically in response to specific communication needs as the plan transfers into a “business as usual” phase.

Experiences from the Nordic and Baltic systems³ show that extensive and continuous emphasis and effort is placed on wide reaching communication campaigns through:

- TV advertisements
- Radio advertisements
- Public advertisements
- Newspaper advertisements
- Social media advertisements
- Online video platforms

Examples from Sweden (Central System Operator: Returpack):

<https://www.youtube.com/watch?v=87e3xEKMhZc&t=31s> (Returpack the movie)

<https://www.youtube.com/user/pantameranu> (Returpack YouTube page)

³ Central System Operators:

- a. Estonia: Eesti Pandipakend (EPP) <https://eestipandipakend.ee/en/>
- b. Finland: Suomen Palautuspakkaus Oy (Palpa) <https://www.palpa.fi/english/>
- c. Lithuania: Užstato Sistemos Administratorius (USAD) <https://grazintiverta.lt/en/for-business/>
- d. Norway: Infinitum <https://infinitum.no/english>
- e. Sweden Returpack: <https://pantamera.nu/om-oss/returpack-in-english/>

Examples from Norway (Central System Operator: Infitum):

<https://www.youtube.com/watch?v=w1P397IE02I> (Infitum Shark ad)

<https://www.youtube.com/user/norskresirk> (Infitum YouTube page)

Examples from Lithuania (Central System Operator: Užtato Sistemų Administratorius (USAD):

<https://www.youtube.com/watch?v=uUJz2SkaPfo> (Explaining the communication campaign)

<https://www.youtube.com/watch?v=6XUP9a94GgA> (Life within an RVM)

Examples from Finland (Central System Operator: [Suomen Palautuspakkaus Oy \(Palpa\)](#))

<https://www.youtube.com/watch?v=rNwAm01Dm-g> (Palpa return system for beverage containers)

Examples from Estonia: Central System Operator: Eesti Pandipakend (EPP)

<https://eestipandipakend.ee/oppematerjalid/>

<https://eestipandipakend.ee/tarbija/video/>

<https://www.youtube.com/channel/UCUSTohxUvyxxWalLkk8hYjQ> (EPP Youtube Page)

In Lithuania, the legislation stipulates that the system “administrator for single-use packaging deposit system shall appropriate at least 1 percent of its annual turnover for public awareness and information on management of packaging waste”. [Article 112 Administration of single-use packaging deposit system (10)].

Through this approach it is guaranteed that particularly at the beginning of the scheme sufficient financial resources are allocated to communication. However, as the system becomes more efficient and the consumer more aware, legislation should be flexible to decreasing the required amount when going into the “business as usual” phase. It should then be up to the Central System Operator to decide the sufficient amount put into communication.

Question 7:

What enforcement measures should be considered in parallel with the introduction of a DRS?

System:

The aim of the DRS should be to maximise the collection quantity and quality of targeted materials, and subsequently increase the high-quality recycling rates through a broad range of beverage containers. The Central System Operator should therefore be responsible for meeting the legally binding collection targets set by the government.

The collection targets, which need to be set by the government, should follow a staggered approach⁴. For example:

- 70% collection in year 1
- 80% collection in year 2
- 90% collection from year 3

It is important that when targets are not met, the system is penalised. If penalties are not in place, the system is, for instance, provided with an economic incentive to keep the collection rates low and maximise the collection of unredeemed deposits. Therefore, any penalty needs to exceed any economic gain the system could have from keeping the collection rates too low.

Penalties could include:

- Doubling the deposit amount
- Financial penalty

Producer:

Front-end fraud: Under-reporting (lower amount of containers reported to the Central System Operator than actually placed onto the market by the producer/importer) results in less money entering the system and potentially resulting in an over-redemption of a specific product, subsequently leading to a financial loss in the system. It is crucial that the Central System Operator constantly checks on producers and importers by focusing on:

1. Sales data vs. return data → If there is an over-redemption by one product, it is likely that the sales figures have been under-reported.
2. Potential parallel (grey) imports at customs, which should be checked regularly.

Any type of fraud by the producers/importers should result in a meaningful penalty.

Retail:

Within a “return to retail” DRS, retailer responsibility includes providing an accessible return location and properly informing the consumer about the DRS. For instance, on the product shelves it is important that the deposit value is displayed separately from the product price, in order for the consumer to understand that the deposit amount is neither a price increase of the product nor a tax, but is a fully refundable deposit. Refusal to accept empty beverage containers or not correctly informing the consumer about how the system operates within the premises should result in a meaningful penalty.

⁴ Common approach applied in various DRS. The most recent inclusion of this approach was done in the Deposit and Return Scheme for Scotland Regulations

Question 8:

How should cross-border issues be treated to ensure producers are not at a competitive disadvantage relative to producers in Northern Ireland?

As the deposit is fully refundable it should not be seen as a price increase and therefore should not pose a competitive disadvantage. Consumers quickly understand the deposit return concept.

Taking into account the theoretical scenario that both, the Republic of Ireland and Northern Ireland operate their individual DRS, there should be no competitive disadvantages, as long as the respective deposit amounts are similar and both systems are run efficiently.

When looking at a DRS market which borders a non-DRS market, another important consideration is cross-border fraud and how this risk might be minimised.

The most common approach within a DRS is to use a domestic/country specific/unique barcode. This way the system is able to clearly identify that the containers returned belong to the respective DRS domestic barcode: this approach entails that the included beverage containers are equipped with a domestic, country specific/unique barcode only to be used in the respective DRS market. Through this approach containers coming from outside the DRS are not accepted within the system and cannot be redeemed.

The incurred costs associated to the barcoding, which is fully financed by the producers, needs to be set in relation to the actual value the collected material has.

As mentioned earlier, the financing of the DRS relies on three main income streams:

1. One of them being the sale of the collected material. For instance:

Metal: In Norway, the value of the collected aluminium cans is so high, that the Administration Fee is negative. This means that the producer is literally getting paid by the Central System Operator for each object placed into the system. In Estonia and Sweden, the Administration Fee is 0. Subsequently, the product price in all three markets should stay at the rate where it is or even decrease.

Plastic: Although the value of the collected materials is higher than in any other collection scheme, it is still not comparable to the value of the aluminium cans. However, it can be observed that the more efficient the system becomes the more the Administration Fees decrease. As a consequence, the product price might increase insignificantly (Lithuania example).

2. The second income stream for the DRS is the unredeemed deposits:

Cross border fraud can result in used beverage containers entering the DRS including a payout of a deposit amount, which was never initially paid into the system. As a consequence, there will be an artificially high collection rate, resulting in a financial loss for the system, which ultimately needs to be compensated by increasing the Administration Fee per unit paid.

In order to reduce the risk of cross-border fraud the following measures should be implemented:

1. **National/domestic barcode** only applicable for the beverage containers sold in the Republic of Ireland.
2. **Visual logo:**
 - a. For consumer information and manual take-back recognition (visual check)
 - b. For technology to recognize the visual in combination with the barcode
3. **Security logo:** unique visual logo printed in special ink as applied in Denmark, Germany or Michigan (only three markets globally) is not recommended to be introduced to the Republic of Ireland's DRS, when taking into account the fraud risk and the associated potential costs attached to this. Applying the above points 1 and 2 should be sufficient.

4. APPENDIX

- a. Handling Fee
- b. TOMRA's Key Design Elements for a Modern DRS – Presentation
- c. TOMRA's Key Design Elements for a Modern DRS - Detailed Handout
- d. Infinitum – Presentation
- e. Palpa – Presentation
- f. USAD – Presentation
- g. EPP - Presentation

a. Handling Fee:

Handling Fees (HF) must cover the direct costs associated to the collection of empty beverage containers.

Costs include:

- Purchase and operating costs of RVMs
- Space requirements
- Electricity and online connection
- Personnel
- Utilities
- Bags used for manual return
- Tags used for manual return
- Transport/logistics (if collected containers are backhauled by retailers)

As the HF is the largest cost for the system it must be carefully calculated and agreed on between the Central System Operator and the retail sector based on the overall system calculation.

Handling fees are usually remitted to the retailer along with the deposit, thereby simplifying the accounting process.

Automated vs. Manual

Handling fees for automated return:

- Higher handling fee compared to manually received containers
- Compaction within the RVM results in lower logistics costs, as less “air” is being transported
- RVMs transfer collection data electronically to the Central System Operator, thereby increasing administrative efficiency.

Handling fees for manual return:

- Lower handling fee compared to automatically received containers
- Non-compaction results in higher logistics costs, as a lot of “air” is being transported
- Manually received containers need to be counted and sorted at the Central System Operators counting centre using an “Industrial RVM”. This additional step increases the operational and administrative costs of the system, resulting in lower handling fees.

In general, the Central System Operator foresees handling fees to retail in order to stimulate automation of the deposit redemption. Automation reduces the cost for logistics through compaction, as well as the costs for administration through online data reporting.

RVMs help to reduce costs of the overall operation of the DRS.



HANDLING FEE

01.02.2016	can aluminium	Bottles PET	Bottles HDPE
RVM with compaction	NOK 0,20	NOK 0,25	NOK 0,25
RVM without compaction and manual receiving	NOK 0,05	NOK 0,10	NOK 0,10

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Source: Infinitum

For further information or clarifications please contact:

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TOMRA's Key Design Elements for a Modern Deposit Return System

Today's Agenda

Time	Session	Facilitator
Time– Time am/pm (duration mins)	Introductions	All
Time– Time am/pm (duration mins)	Introduction to TOMRA	Your name
Time– Time am/pm (duration mins)	Key Principles and Elements of Modern Deposit Return Systems	Your name
Time– Time am/pm (duration mins)	Q&A	Your name



At TOMRA, it is our Mission to
LEAD THE RESOURCE REVOLUTION

That means using our planet's precious resources as
efficiently as possible —today and tomorrow



4,500+ Employees
Globally

Ca. €880m
Annual Turnover
In 2019



FOOD

RECYCLING

MINING



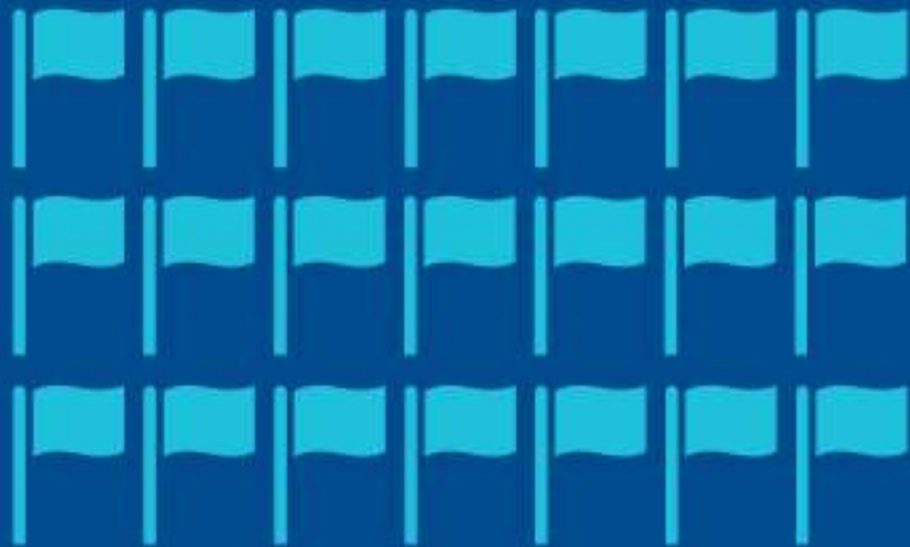
REVERSE VENDING

MATERIAL RECOVERY

TOMRA Collection Solutions
is the world's largest supplier
of reverse vending solutions,
helping to incentivize
recycling at scale.



Deposit policies are undergoing a resurgence



21

Countries have passed
container deposit laws since 2005.

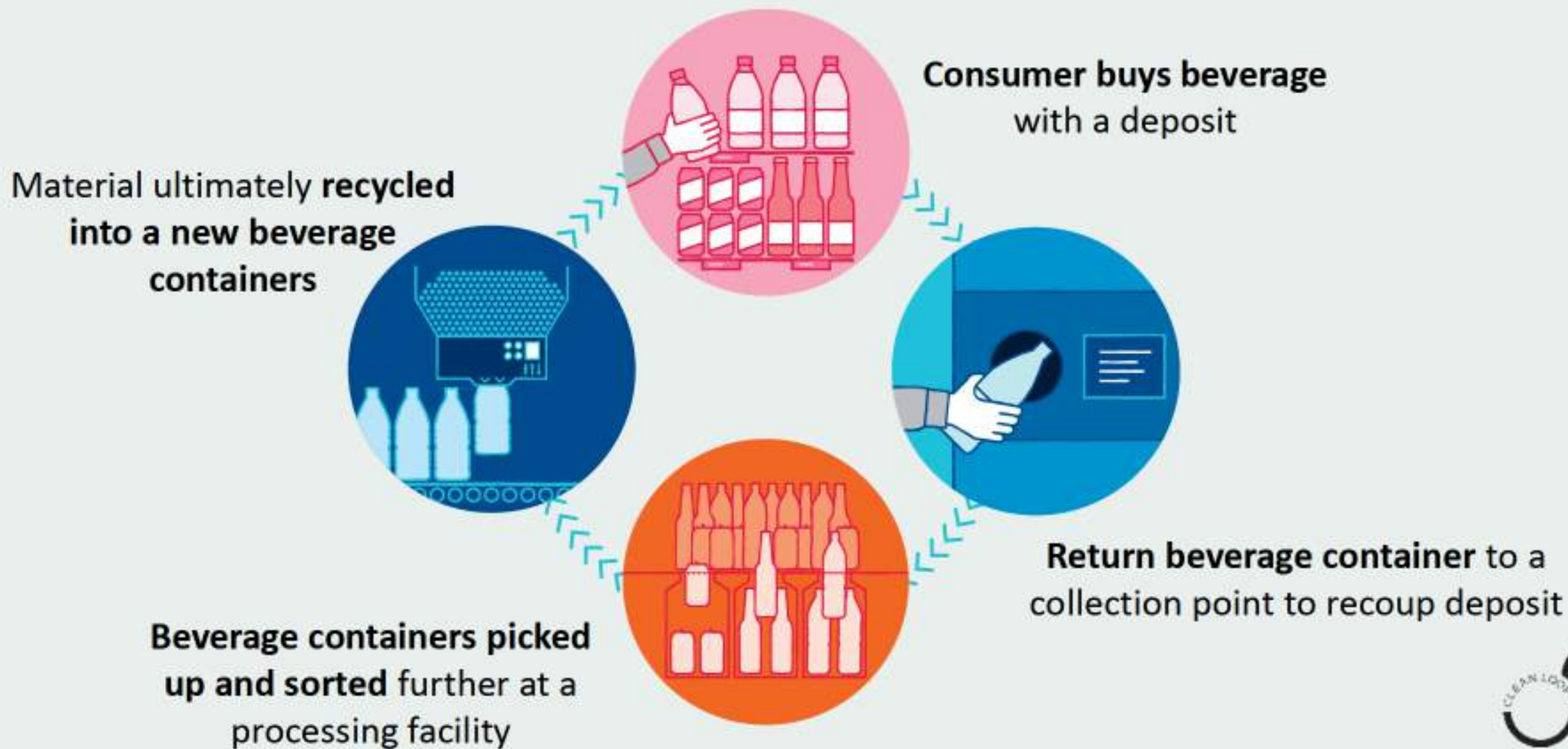
10 in 2018 alone!



The EU Single Use Plastic Directive mandates a
90% collection rate for plastic bottles.

**This signals that almost all EU member
states will adopt deposit systems**

How a Deposit Return System Works



Principles of a Modern Deposit Return System

What We've Learned: modern Deposit Return Systems prioritize four principles



Performance

A minimum deposit value and broad beverage scope **delivers strong results.**



Convenience

Redemption is **accessible and fair** for all users.



Producer responsibility

Producers finance the system supported by a **balanced funding structure.**



System integrity

Producers manage the system, with government oversight.

#1

Broad scope of beverages and containers



Beverage Type



Container Material

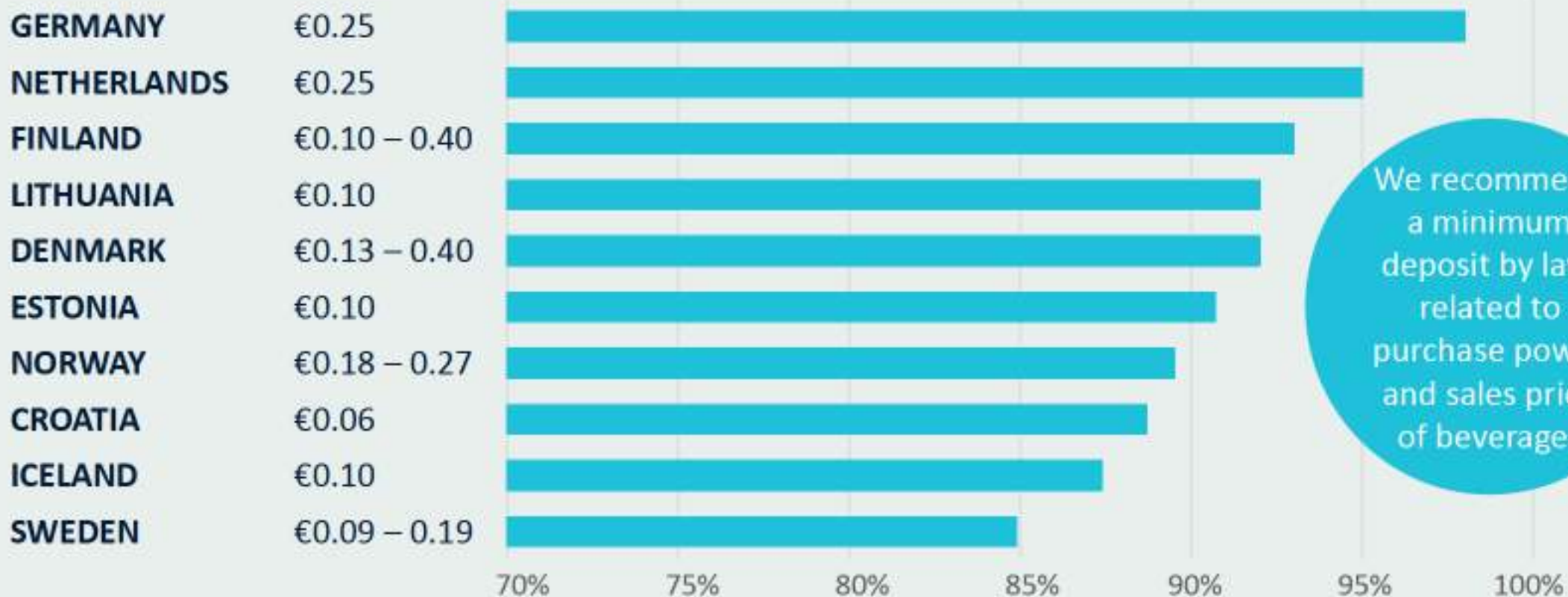


Container Size



Minimum deposit value

Top Ten Highest Performing DRS - Europe (2019).
Deposit Values vs. Redemption Rates



We recommend a minimum deposit by law, related to purchase power and sales price of beverages

#3

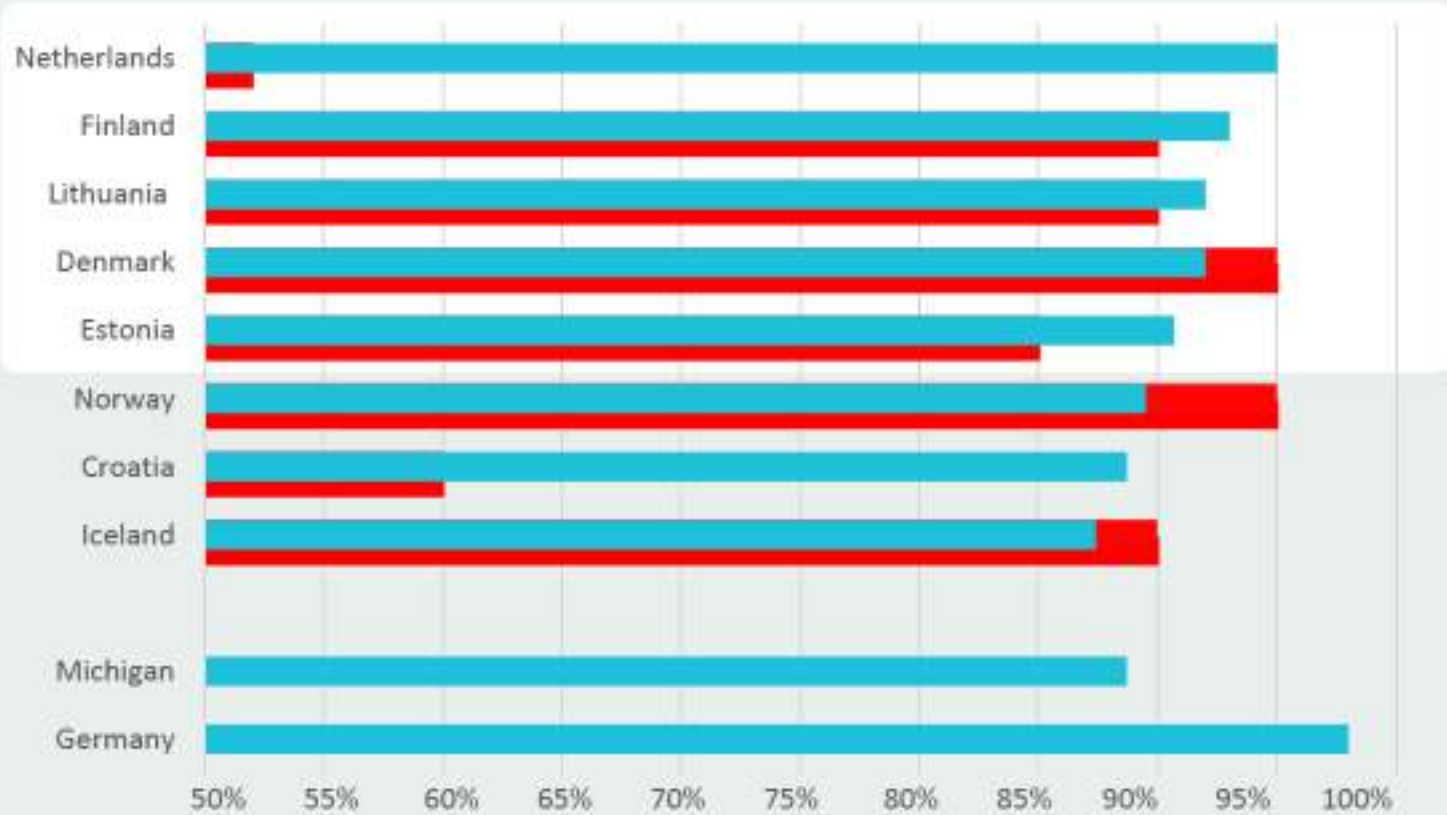
Return-Rate Target



Modern DRSs are capable of routinely achieving a 90% return rate for recycling or more.

A 'return rate target' establishes one goal for all stakeholders to work towards and avoids any perverse incentives like purposefully keeping the return rate low to collect unredeemed deposits.

Top Ten Highest Performing Deposit Systems (2019 Redemption Rates)



No legal requirement due to high deposit amount of 10 €ct.

No legal requirement due to very high deposit amount of 25 €ct.

#4

Convenient redemption system for consumers

CONVENIENCE

9 out of 10

of the highest performing
Deposit Return Systems
in the world are
'Return to Retail'
models

GERMANY
NETHERLANDS
LITHUANIA
FINLAND
NORWAY
ESTONIA
DENMARK
CROATIA
MICHIGAN

#5

Separately charged and fully refundable deposits

CONVENIENCE



#6

Container deposit markings for consumers, barcodes for accurate counting

CONVENIENCE



GERMANY



SWEDEN



USA

Solutions for small quantities



DENMARK



NORWAY



ESTONIA



#7

Extended producer responsibility financing

PRODUCER RESPONSIBILITY

Producer responsibility derives from:



Legal pressure



Public pressure

Producers cover:

An EPR fee per container reflecting the Net costs of the program

“Producers” include: Brand owners and importers (including e-commerce)

#8

Reinvestment of unredeemed deposits and material revenue within the system

PRODUCER
RESPONSIBILITY



Recyclable commodity value



Unredeemed deposits

#9

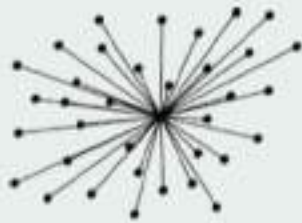
Recycled content requirements

PRODUCER
RESPONSIBILITY

- DRSs ensure containers consumed in a region are collected for recycling.
- Minimum recycled content standards address the other part of the equation: ensuring new bottles are made out of recycled material.



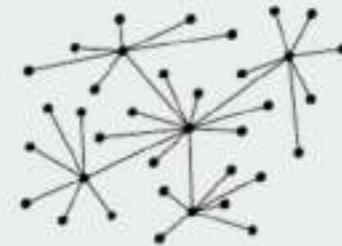
Centralized, non-profit administration and operations



Centralized

Centralized management of the DRS by a non-profit owned by beverage producers and retailers

- Enables the system to run at the lowest possible cost (eliminates need for redundant contract services)
- Streamlines decision-making when program improvements are necessary
- Increases system integrity, minimizes 'free riders'



Decentralized

Individual brand owners are directly and individually responsible for administering the system

- Leads to brand owner and system-wide costs due to redundancies of services like container pick-ups and financial reconciliation.
- Lack of central coordination can stymie program improvements
- Typically lacks product registration resulting in product or distributor 'free riders' and consumer confusion when eligible containers are rejected for redemption

Breaking down the role of a Centralized System Manager



Owned and financed by

- Beverage producers and retailers
- Typically operates as a non-profit

Mission

- Accomplish all defined and set targets at lowest possible costs for its stakeholders

Responsibilities

- Deposit clearing
- Product registration
- Fraud protocol development
- Data management
- Performance reporting to government and communications to public
- Fulfillment of overall obligations and targets

Government reporting and consumer communication



Government Reporting



Consumer Communication

#12

Government-regulated outcomes

SYSTEM INTEGRITY

Legislator must define:

Clear penalties for:
Illegal activities
Missed targets

Enforcement agency

Audit protocols

Principles & Elements of Modern Deposit Return Systems



Performance

1. Broad scope of beverages and containers
2. Minimum deposit value
3. Return-rate target



Convenience

4. Convenient redemption system for consumers
5. Separately charged and fully refundable deposits
6. Container deposit markings for consumers, barcodes for accurate counting



Producer responsibility

7. Extended producer responsibility financing
8. Reinvestment of unredeemed deposits and material revenue within the system
9. Recycled content requirements



System integrity

10. Centralized, non-profit administration and operations
11. Government reporting and consumer communication
12. Government-regulated outcomes

Q&A



Thank you!

APPENDIX

TOMRA's Key Design Elements for a Modern Deposit Return System



1: Broad scope of beverages and containers



2: Minimum deposit value



3: Return-Rate Target



4: Convenient redemption system for consumers



5: Separately charged and fully refundable deposits



6: Container deposit markings for consumers, barcodes for accurate counting



7: Extended producer responsibility financing



8: Reinvestment of unredeemed deposits and material revenue within the system



9: Recycled content requirements



10: Centralized, non-profit administration and operations



11: Government reporting and consumer communication



12: Government-regulated outcomes



About TOMRA



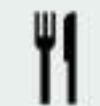
TOMRA SYSTEMS, ASA: TOMRA was founded on an innovation in 1972 that began with the design, manufacturing and sale of reverse vending machines (RVMs) for automated collection of used beverage containers. Today TOMRA provides technology-led solutions that enable the circular economy with advanced collection and sorting systems that optimize resource recovery and minimize waste in the food, recycling and mining industries.



TOMRA COLLECTION SOLUTIONS: With an installed base of approximately 83,000 systems in over 60 markets, TOMRA Reverse Vending is the world's leading provider of reverse vending solutions. Every year TOMRA facilitates the collection of more than 40 billion empty cans and bottles and provides retailers and other customers with an effective and efficient way of collecting, sorting and processing these containers.



TOMRA's material recovery business includes the pick-up, transportation, and processing of used beverage containers in North America, as well as the subsequent brokerage of the processed material to recyclers. The revenue stream in this business area is derived from fees received from bottlers based on the volume of containers processed. Currently, TOMRA Material Recovery processes over 340,000 metric tons of containers annually.



TOMRA SORTING SOLUTIONS: TOMRA Sorting Solutions creates sensor-based technologies for sorting and process analysis within the recycling, mining, food and other industries. With more than 13,740 installations worldwide, TOMRA Sorting Solutions offers a unique range of complementary sorting technologies, the most extensive service base, and the widest geographic and market segment coverage in the industry.



TOMRA Food is the leading provider of optical sorting and processing technology for the fresh and processed food industry. With approximately 10,210 sorting installations globally, TOMRA Sorting's food business is instrumental in optimizing the world's food utilization, safety and quality.

TOMRA Recycling is a global leader in its field and has pioneered the automation of waste sorting. Its flexible sorting systems perform an extensive range of sorting tasks and are able to both prepare and sort various types of metals and waste for either material recycling or energy recovery. Currently TOMRA Sorting Recycling has an installed base of close to 5,960 units across more than 40 markets.



TOMRA Mining provides a complete product portfolio for efficient material separation in various minerals and ore applications such as processing of industrial minerals, diamonds and gemstone recovery, and metal recovery from slag etc. With approximately 153 installations worldwide, TOMRA Sorting's mining business helps to extend the lifetime of mining operations, increasing the value of the deposit.

Altogether TOMRA has approximately 100,000 installations in over 80 markets worldwide and had total revenues of about 8.6 billion NOK in 2018. The TOMRA Group employs roughly 4,000 people globally, and is publicly listed on the Oslo Stock Exchange. (OSE: TOM).

TOMRA's Key Design Elements for a Modern Deposit Return System

Introduction



More countries are considering the implementation of a Deposit Return System (DRS) for single-use beverage containers, to address the challenges of meeting new waste recovery targets, ending littering and moving towards a 'circular economy'.

Given our experience in over 60 deposit markets, TOMRA has working-knowledge of the practices from around the world that separate high performing deposit systems from low-performing systems. In addition we are familiar with solutions to many of the challenges that stakeholders commonly face when designing deposit systems such as how DRS, curbside, 'informal economies' and other collection models can work together to eliminate waste and maximize resource recovery.

This year, our team conducted a review of every global deposit system and our 40+ years of experience in such markets to define our key learnings. The result of this analysis are included in this document and we are happy to share it with you.

We found that all high-performing deposit systems prioritize four principles: Performance, Convenience, Producer Responsibility, and System Integrity. Throughout this document we explain each principle and the twelve key elements that define each in practice. All of the elements, when applied together, will address these challenges we share today.

To implement a high-performing DRS, modifications of statutes, regulations and business models should be assumed.

What We've Learned: Modern Deposit Return Systems Prioritize Four Principles



Performance

A minimum deposit value and broad beverage scope **delivers strong results.**



Convenience

Redemption is **accessible and the system is fair** for all users.



Producer responsibility

Producers finance the system supported by a **balanced funding structure.**



System integrity

Producers manage the system, with government oversight.

Principles & Elements of Modern Deposit Return Systems



Performance

1. Broad scope of beverages and containers
2. Minimum deposit value
3. Return-rate target



Convenience

4. Convenient redemption system for consumers
5. Separately charged and fully refundable deposits
6. Container deposit markings for consumers, barcodes for accurate counting



Producer responsibility

7. Extended producer responsibility financing
8. Reinvestment of unredeemed deposits and material revenue within the system
9. Recycled content requirements



System integrity

10. Centralized, non-profit administration and operations
11. Government reporting and consumer communication
12. Government-regulated outcomes

Overview: Elements of a Modern Deposit Return System

#1: Broad scope of beverages and containers



To prevent confusion with the consumers, the legislation should clearly define the scope of the DRS.

Legislation should state which type of beverages (e.g. mineral water, soft incl. sport drinks, juices, beer & cider, ready2drink tea and coffee, energy drinks, wine & liquors) are covered in which packaging materials (e.g. plastics, metals, glass, liquid paper board) and define the volume range (0,1 l to max. 3 l or 4 ounces to max. 101 ounces).

The specific challenges of each country/state/region should be taken into account, at the same time preventing market distortion and creating a fair playing field for producers and importers.

#2: Minimum deposit value



Giving a financial value to beverage containers indicates that they have a value for the society. Containers are viewed and treated as a resource, rather than trash.

A meaningful deposit is most effective, so consider the purchasing power of the respective market. Set it high enough to motivate the consumers to return their empty containers at a rate of 90%+, while not encouraging fraud.

A single deposit value for all beverages, packages and volumes is easiest for consumers to understand.

The DRS operator might propose a higher deposit than the minimum deposit defined by legislator, which of course must ultimately be approved by the government.

#3: Return-Rate Target



The legislator must define a minimum return rate target for the eligible containers under the DRS.

Today, all the high-performing programs have redemption rates exceeding 90% of the containers sold. This is achievable primarily through setting the correct deposit-level and providing convenient redemption opportunities.

Legislator could aim for staggered return rate target of at least 90% after the DRS is matured - e.g. return rate target of 70% the first year, followed by progressively increased targets to 90% upon year 3.

#4: Convenient redemption system for consumers



The most convenient programs are those, where the parties selling the beverages are also responsible for the take back of the empty containers. This concept is called return2retail.

Consumers will simply combine the return of the empty containers with the shopping of new goods. No extra tours to dedicated collection points are required - no additional traffic or emissions. All DRSs based on this return2retail concept prove significantly lower carbon footprint than other collection concepts, e.g. return2depot.

Depending on country specific circumstances, the legislator might consider exemptions from the take back obligation if the store is too small - e.g. below 100 m². Or it might plan for differentiated handling demands in urban vs. rural areas - <100 m² in urban area is not demanded to take back whereas the <100 m² in rural area must take back.

Of course, non-obliged retailers can opt in and participate in the DRS anyhow.

Retailers taking deposit containers back should receive a cost compensation for their services, a so-called handling fee - both for manual and automated accepted containers.

#5: Separately charged and fully refundable deposits



A deposit is a fully transparent amount of money, which is given as a security for an item (the beverage container) acquired for temporary use and should therefore be displayed and charged as a separate amount on top of the ordinary product sales price.

Consumer confusion through the integration of the deposit in the product price must be prevented.

The deposit value must be fully refunded when the eligible, empty container is returned to a redemption point.

Deposit should be exempted from VAT (sales tax).

#6: Container deposit markings for consumers, barcodes for accurate counting



Every deposit container must carry a visual deposit logo, to enable the consumer to identify the deposit container as such.

The visual marking will also help the manual collection points to conclude the eligibility of a container.

In addition, the container must have a barcode according to GS1 standards, to allow for automated identification.

#7: Extended producer responsibility financing



The beverage industry and importers have, as part of their extended producer responsibility, to cover the potential net costs of the system and pay an EPR fee per deposit container sold to the market and reported to the DRS management organization.

To prevent cross-subsidizing from one material to the other, it is recommended to create individual cost centers per material fraction.

Producers (brand owners and importers), selling the beverages incl. e-commerce, are initiating the deposit and charging it to their clients.

In centrally operated DRS, the beverage industry and importers are then forwarding the received deposit money to the DRS management organization.

#8: Reinvestment of unredeemed deposits and material revenue within the system



The deposits, which are not reclaimed by the consumers, remain with the DRS respectively its management organization.

The total unredeemed deposit and the income from the sales of the collected packaging material is used to finance the DRS. In case it is not covering all the costs, the remaining net costs will be financed through a separate EPR fee, to be charged per container to the beverage industry/importers.

A budget process with projections of total beverage container sales and return rates including resulting unredeemed deposits and material value for the next business year will conclude the EPR fees per packaging type.

#9: Recycled content requirements



DRS maintains the cleanest material streams in high quantities. This allows for a constant and reliable material supply for high-grade, closed-loop applications.

This reduces reliance on raw materials (coming into the loop) and waste ending up in nature and landfills (going out of the loop).

The legislator should consider a mechanism to award higher recovery rates as well as the circularity of the resources run in the DRS (recycling content) through eco-modulation of fees.

#10: Centralized, non-profit administration and operations



Best results and prime transparency are accomplished, if the various streams (money, material & data) within the DRS are managed by a centralized non-profit organization, mutually owned by the obligated stakeholders, i.e. beverage industry/importers and retail.

The beverage industry/importers must bear the net costs of the system as a result from their EPR obligation and therefore it should be natural that they together with the other obligated party - the retail - own the management organization of the DRS.

Intention of the management organization is to accomplish all defined and set targets at lowest possible costs for its stakeholders. A possible profit would increase the overall system costs and is therefore not wanted.

The centralized non-profit organization should set-up a central container registration and maintain it in a central data base.

The entity will provide the central financing of the system, including the deposit clearing based on return figures of the products' barcodes. It must handle all data from individual stakeholders confidentially and consolidate those for reporting streams in an anonymous manner.

#11: Government reporting and consumer communication



The DRS management organization should be obliged to report at least once per year the audited, aggregated sales and collection reports per material fraction for the previous period to the responsible ministry in the Government.

The legislator should further demand that the DRS management organization publishes a publicly available annual report.

DRS management organization should run public awareness campaigns.

Communication of good results will also demonstrate environmental credentials to voters and consumers.

This image at left is from [“Hello, I’m Seamus and I Want a Fish!”](#) a short video raising awareness of the container deposit system in Oregon, developed by the system’s operator, the Oregon Beverage Recycling Cooperative, and shared on social media.

#12: Government-regulated outcomes



The legislator must define clear penalties for criminal or illegal activities (e.g. fines) as well as liabilities for system non-achievements (e.g. a progressive environmental fee), which significantly exceed the value of the savings from the underperformance.

The legislator should define the enforcing and acting agency.



www.tomra.com

Appendix

TOMRA's Key Design Elements for a Modern Deposit Return System



1: Broad scope of beverages and containers



2: Minimum deposit value



3: Return-Rate Target



4: Convenient redemption system for consumers



5: Separately charged and fully refundable deposits



6: Container deposit markings for consumers, barcodes for accurate counting



7: Extended producer responsibility financing



8: Reinvestment of unredeemed deposits and material revenue within the system



9: Recycled content requirements



10: Centralized, non-profit administration and operations



11: Government reporting and consumer communication



12: Government-regulated outcomes



About TOMRA



TOMRA SYSTEMS, ASA: TOMRA was founded on an innovation in 1972 that began with the design, manufacturing and sale of reverse vending machines (RVMs) for automated collection of used beverage containers. Today TOMRA provides technology-led solutions that enable the circular economy with advanced collection and sorting systems that optimize resource recovery and minimize waste in the food, recycling and mining industries.



TOMRA COLLECTION SOLUTIONS: With an installed base of approximately 83,000 systems in over 60 markets, TOMRA Reverse Vending is the world's leading provider of reverse vending solutions. Every year TOMRA facilitates the collection of more than 40 billion empty cans and bottles and provides retailers and other customers with an effective and efficient way of collecting, sorting and processing these containers.



TOMRA's material recovery business includes the pick-up, transportation, and processing of used beverage containers in North America, as well as the subsequent brokerage of the processed material to recyclers. The revenue stream in this business area is derived from fees received from bottlers based on the volume of containers processed. Currently, TOMRA Material Recovery processes over 340,000 metric tons of containers annually.

TOMRA SORTING SOLUTIONS: TOMRA Sorting Solutions creates sensor-based technologies for sorting and process analysis within the recycling, mining, food and other industries. With more than 13,740 installations worldwide, TOMRA Sorting Solutions offers a unique range of complementary sorting technologies, the most extensive service base, and the widest geographic and market segment coverage in the industry.



TOMRA Food is the leading provider of optical sorting and processing technology for the fresh and processed food industry. With approximately 10,210 sorting installations globally, TOMRA Sorting's food business is instrumental in optimizing the world's food utilization, safety and quality.



TOMRA Recycling is a global leader in its field and has pioneered the automation of waste sorting. Its flexible sorting systems perform an extensive range of sorting tasks and are able to both prepare and sort various types of metals and waste for either material recycling or energy recovery. Currently TOMRA Sorting Recycling has an installed base of close to 5,960 units across more than 40 markets.



TOMRA Mining provides a complete product portfolio for efficient material separation in various minerals and ore applications such as processing of industrial minerals, diamonds and gemstone recovery, and metal recovery from slag etc. With approximately 153 installations worldwide, TOMRA Sorting's mining business helps to extend the lifetime of mining operations, increasing the value of the deposit.

Altogether TOMRA has approximately 100,000 installations in over 80 markets worldwide and had total revenues of about 8.6 billion NOK in 2018. The TOMRA Group employs roughly 4,000 people globally, and is publicly listed on the Oslo Stock Exchange. (OSE: TOM).

INFINITUM





PLASTIC CHALLENGE – EFFICIENT
SOLUTIONS TO SECURE LITTER FREE
NATURE AND MAXIMIZED
COLLECTION

Kjell Olav Maldum, Infinitum AS,



HIGHLIGHTS OF THE NORWEGIAN DRS:

- system organized by producers;
- cost efficient set up;
- all selling points obliged to take back;
- environment benefits compared to the curbside system (example of ROAF);
- collection of caps;
- inspiration for Scotland



- system organized by producers;
- all selling points obliged to take back;

INFINITUM NORWEGIAN REGULATIONS AND MARKET



NO DEPOSIT, NO RETURN

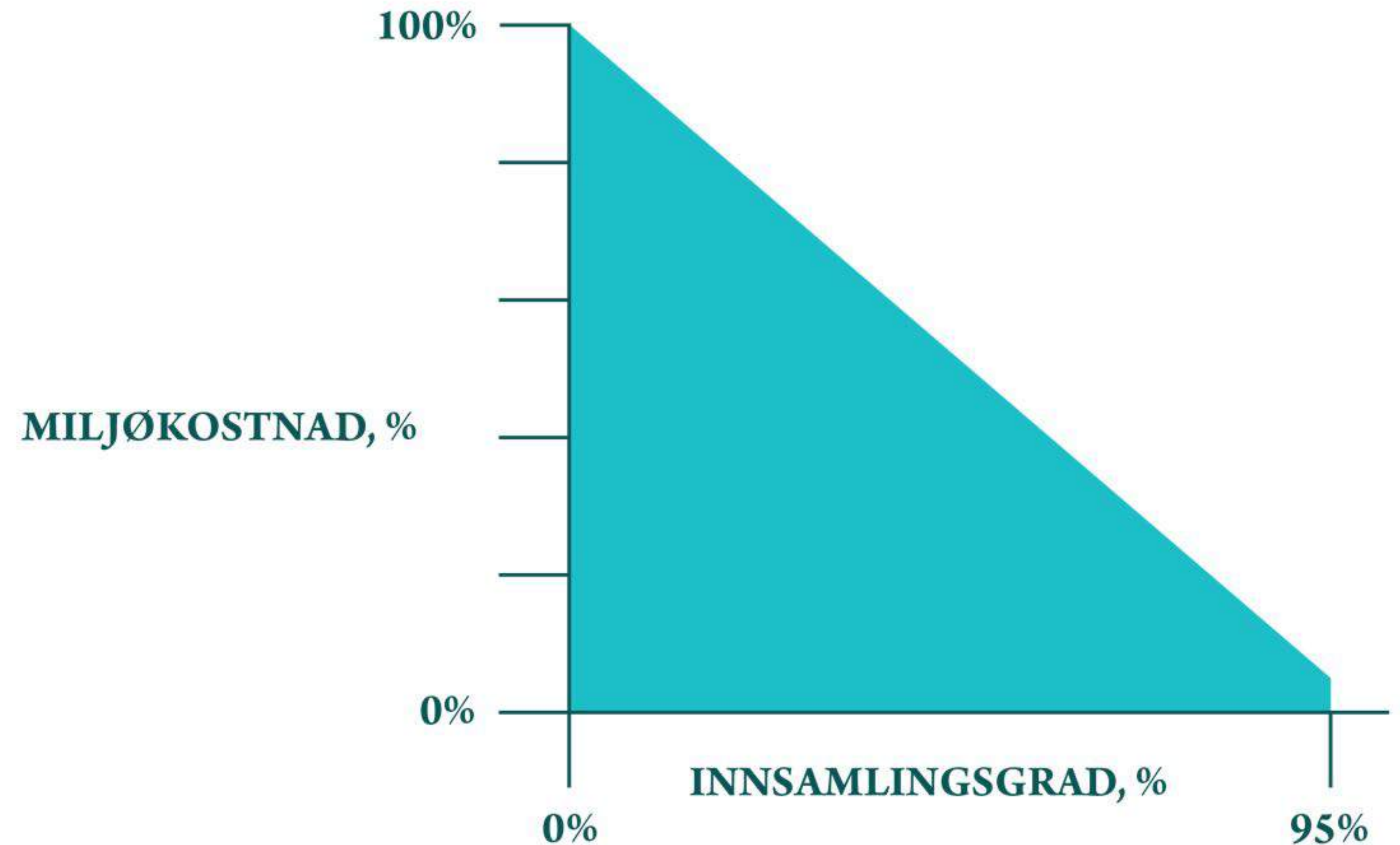




ENVIRONMENTAL COST

- Anti litter cost!

- The environmental cost is re increasing collection rate
 - Cans: kr. 5,88 - 0,61 EUR - 35 000,-/ton
 - Bottles: kr. 3,55 - 0,37 EUR - 10 000,-/tc



COLLECTION OF BEVERAGE CONTAINERS IN NORWAY



Curbside, one way glass and metal



Reusable Packaging
(breweries and beverage association)



Plastic packaging, packaging cardboard
and beverage cartons



Deposit systemet





CHAPTER 6. TAKE-BACK SYSTEMS FOR BEVERAGE PACKAGING

Regulations relating to the recycling of waste (Waste Regulations). This is an unofficial translation of the [Norwegian regulations](#).
Adopted under section 4 of the Act of 11 June 1976 No. 79 relating to the control of products and consumer services (the Product Control Act).

Section 6-1. Scope

The provisions of this chapter apply to take-back systems for beverage packaging. The provisions of this chapter apply only to take-back systems for packaging that are used in the distribution of beverages all the way to the consumer.

Section 6-2. Purpose

The purpose of the provisions of this chapter is to promote effective take-back systems for beverage packaging with a high recovery rate, so that these systems help to prevent litter and reduce waste from such packaging.

Section 6-3. Definitions

In this chapter, take-back system means a system under which the consumer can return empty packaging free of charge for recovery.

In this chapter, beverages means beverages in liquid form only, including liquid concentrates intended for mixing.

In this chapter, recovery means reuse, recycling and energy recovery.

In this chapter, deposit and return scheme means a scheme under which the consumer and the point of sale pay a certain amount (deposit) for the packaging of an article on condition that the amount is refunded to the purchaser when the empty packaging is returned. In this chapter, primary packaging means a packaging unit (bottle, box or similar) into which the beverage is filled.

Section 6-4. Establishment and approval of take-back systems

The individual manufacturer or importer of beverages may set up and manage or join a take-back system for primary packaging. **The Norwegian Environment Agency will decide whether a take-back system is to be approved.**

A requirement for approval is that the take-back system is expected to achieve a minimum recovery rate of 25 %, and that the packaging is recovered in an environmentally sound way. Take-back systems based on energy recovery will only be approved if reuse or recycling is not technically, environmentally or financially feasible. Conditions may be set for approval.

Section 6-5. Determination of the return rate

The Norwegian Environment Agency will determine the return rate that a take-back system can be expected to achieve.

The return rate is set in advance for a maximum of one year at a time. **Decision on return rates are used as the basis for a reduction of the tax levied in accordance with the regulations issued by the Ministry of Finance relating to special taxes**, see Chapter 3-5 on taxes on beverage packaging (environmental tax and basic tax).

Section 6-6. Labelling

Primary packaging that is included in a deposit and return scheme shall carry a deposit symbol showing the amount of the deposit. The minimum size of the deposit symbol shall be 9 mm x 9mm.

The deposit mark shall be printed on the primary packaging itself or on the label. For imported products and products belonging to small product series, an adhesive label may be used.

The minimum size requirement for the deposit symbol, see the first paragraph, applies from 1 September 2018.

Section 6-7. Return of packaging that is included in a deposit and return scheme to points of sale

Points of sale of beverages in packaging that is included in a deposit and return scheme have a duty to accept reasonable quantities of empty packaging for products that they themselves retail. When packaging is returned to a point of sale, the consumer may claim a cash refund of the deposit.

Section 6-8. Deposit rates

For primary packaging included in a deposit and return system, the point of sale and the consumer shall pay a deposit according to the following rates:

a) for primary packaging with a nominal volume of up to and including 50 cl: NOK 2.00 per unit

b) for primary packaging with a nominal volume of more than 50 cl: NOK 3.00 per unit.

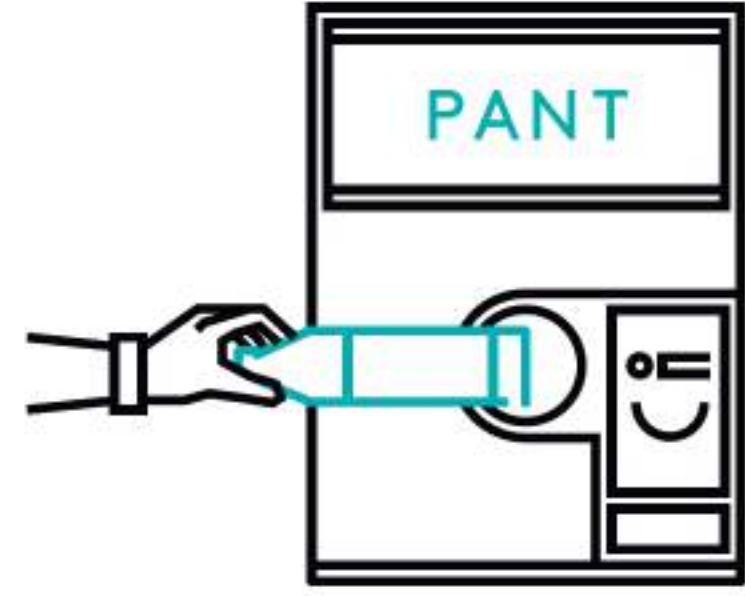
If the purchase price of primary packaging exceeds the deposit rates set out in the first paragraph, or if the return rate for a type of primary packaging is particularly low, the company operating a take-back system may request the Norwegian Environment Agency to determine a higher deposit rate. The Norwegian Environment Agency may set conditions for determining special deposit rates.

Section 6-9. Prohibition on particular forms of packaging

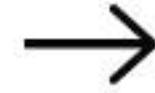
The Norwegian Environment Agency may prohibit the use of primary packaging that hinders the appropriate implementation of established deposit and return schemes.



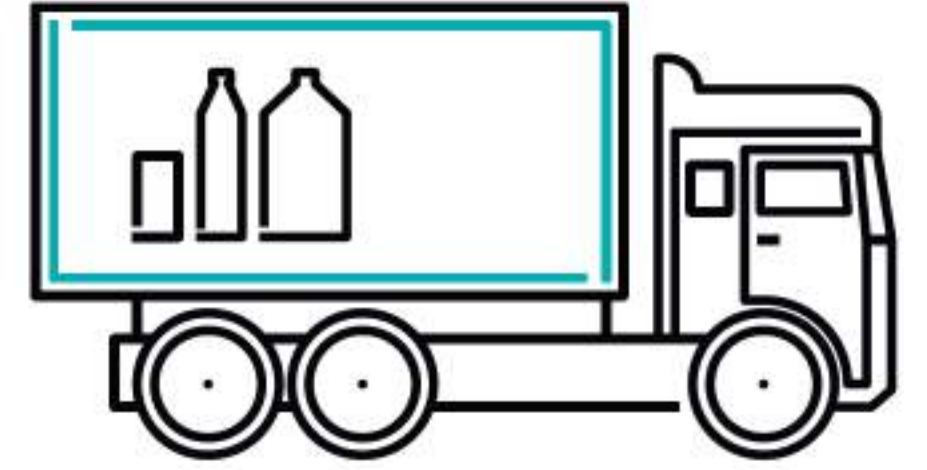
Happiness



Pant



Preparation



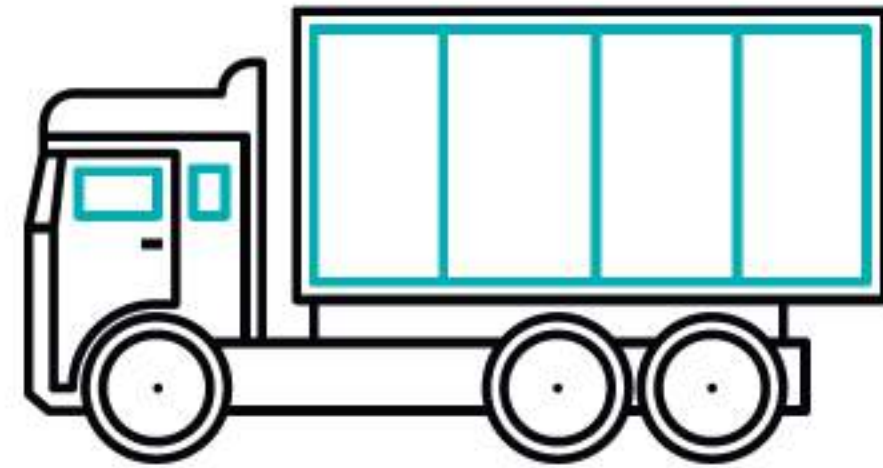
Pick up



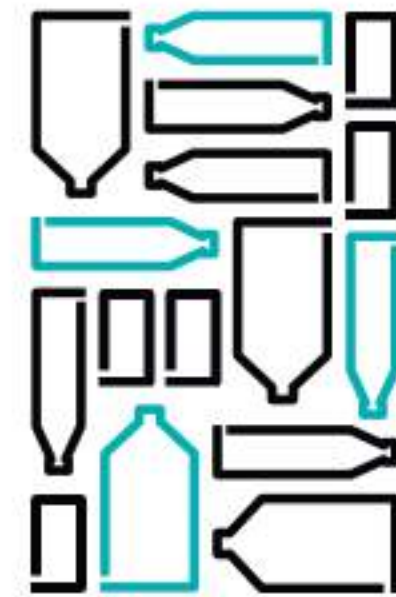
INFINITUM



High grade recycling



Transport



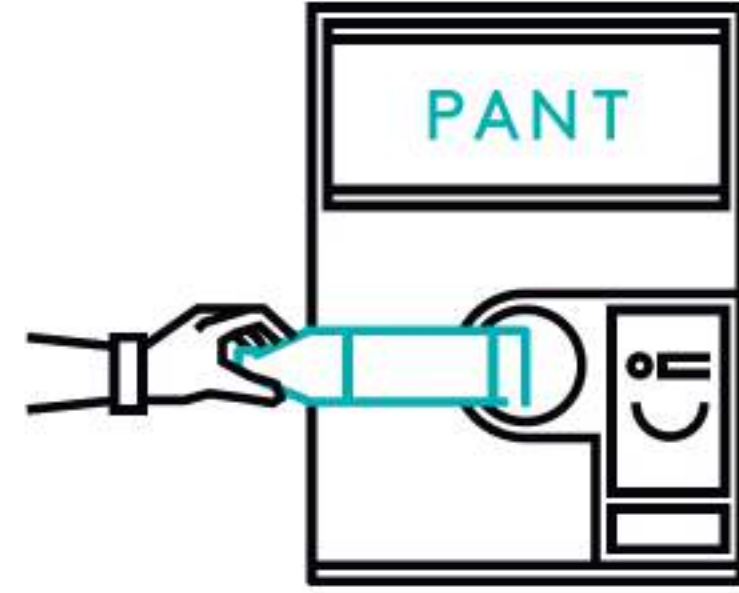
Sorting and bailing



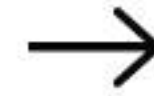
Transport



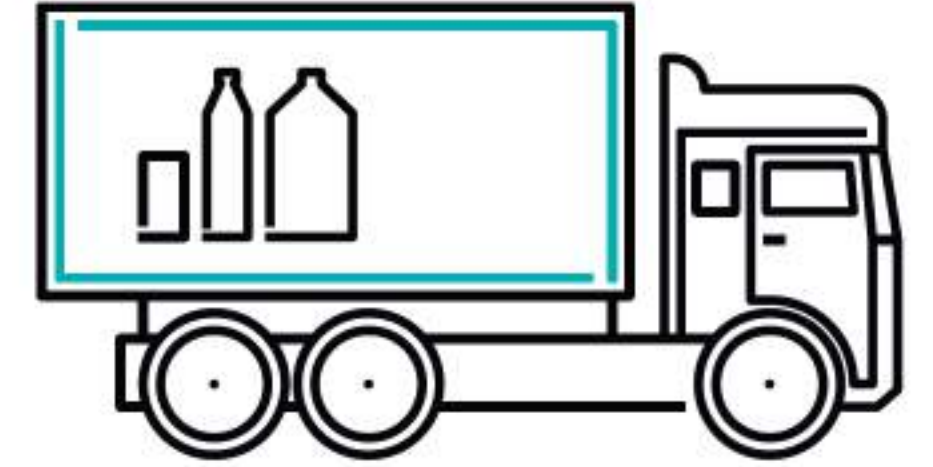
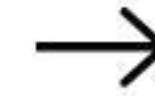
Happiness



Pant



Preparation



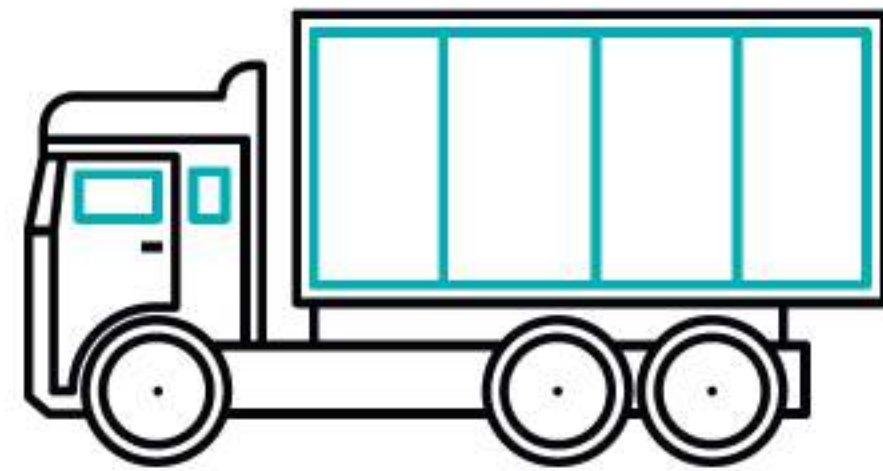
Pick up



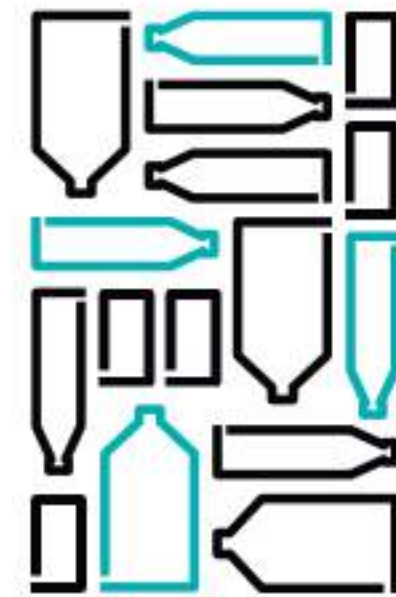
100% PRODUCER RESPONSIBILITY



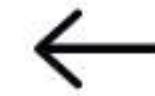
High grade recycling



Transport



Sorting and bailing



Transport



INFINITUM AS

Private owned value chain company owned 50/50 producer and retail
Operation started 3. of may 1999. DRS in Norway since 1902.

1.3 billion cans and bottles in 2019.

- 22 400 tonnes of PET
- 80% of recycled content in all PET bottles possible in Norway today!
- 9 300 tonnes of aluminum
- Recovered by Hydro Holmestrand (Norway)

Shortest possible path between main task for the packaging material



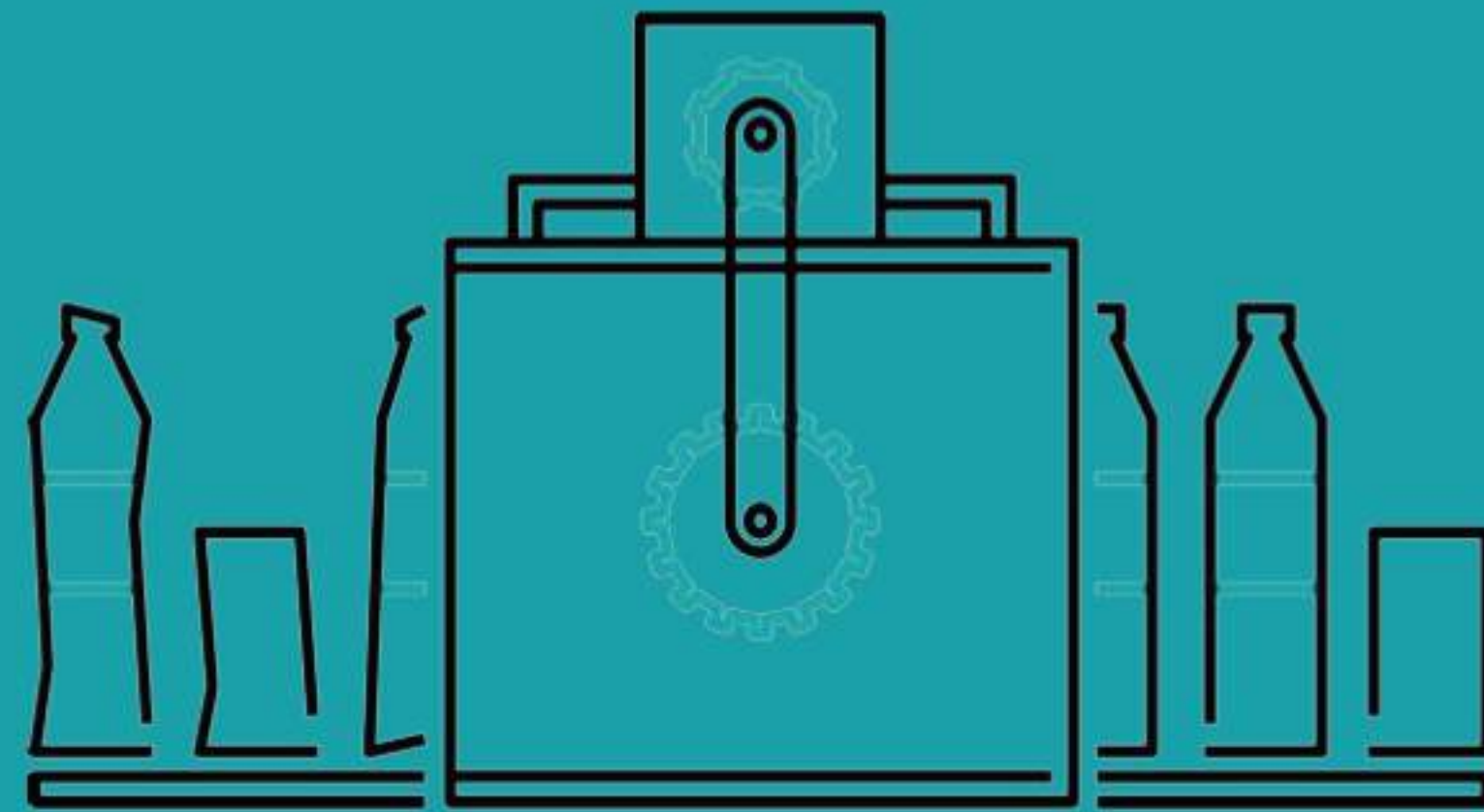
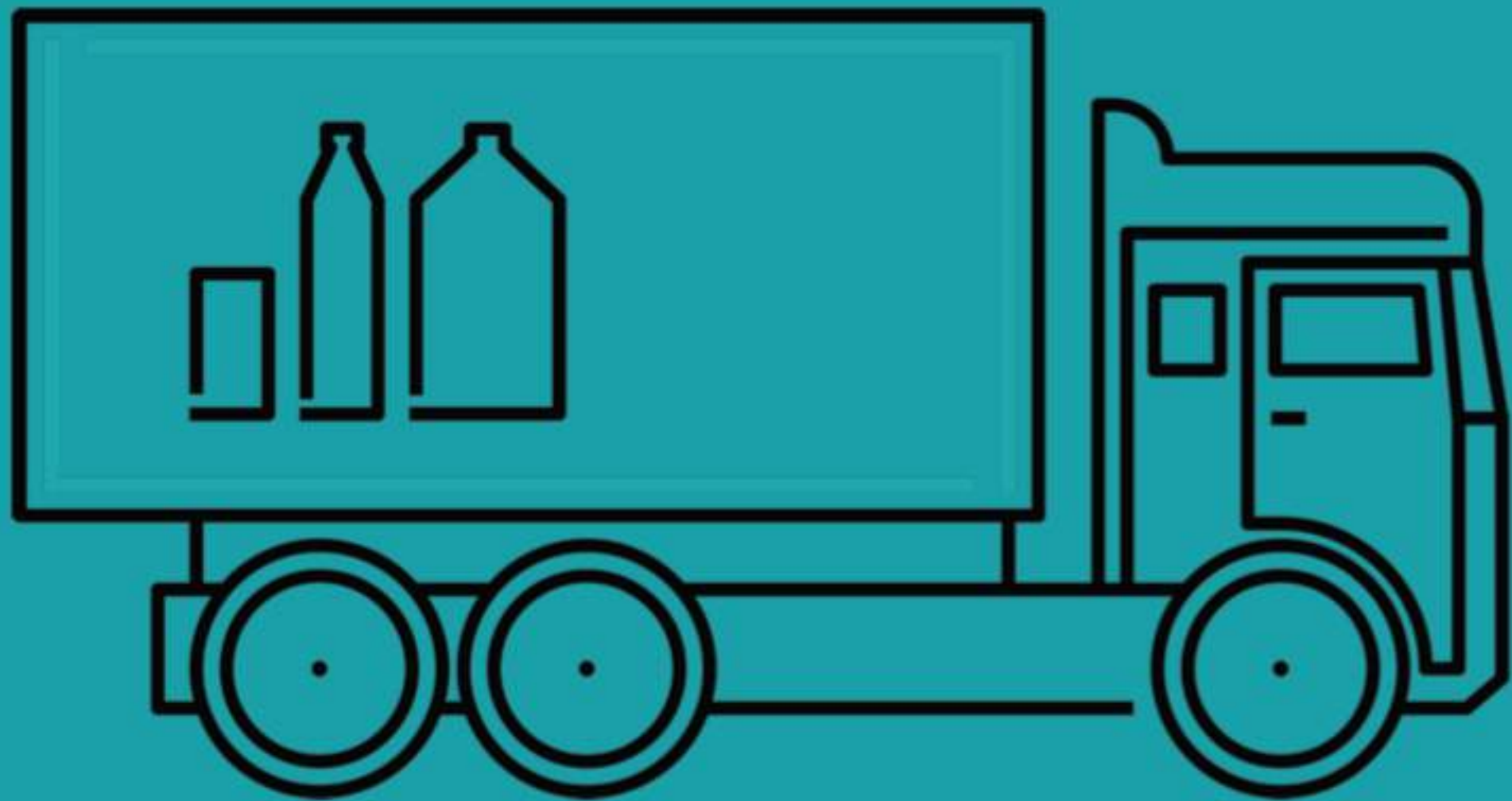
IMPORTANT QUESTIONS TO ASK

- What's the problem?
 - Littering and/or resources
 - Deliver a product/service at lowest environmental impact possible
- What's the collection rate?
 - How to achieve highest possible collection rates?
- What's the yield in collection and recycling process?
 - How to achieve the highest environmental effect
- What's the cost per unit for the producer/consumer?
(extended producer responsibility cost)
 - How to achieve the lowest pr unite?



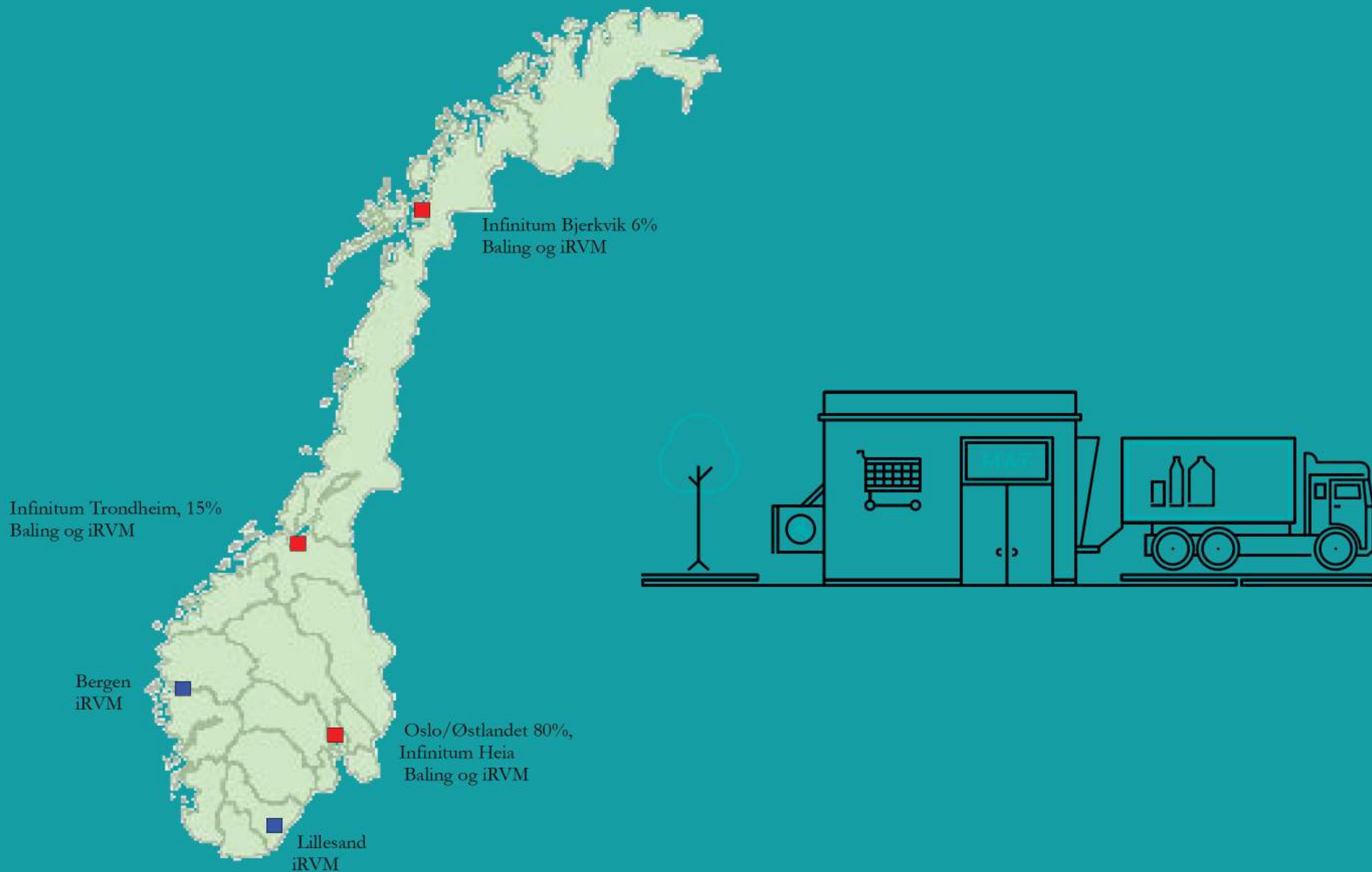
- cost efficient set up;

LOGISTICS AND PRODUCTION





PRODUCTION FACILITIES





EFFICIENT LOGISTICS

94% collected through 3 700
RVM in grocery stores
1,5 mill bags



6 % from 11 300 pick up
points without RVM
400 000 bags



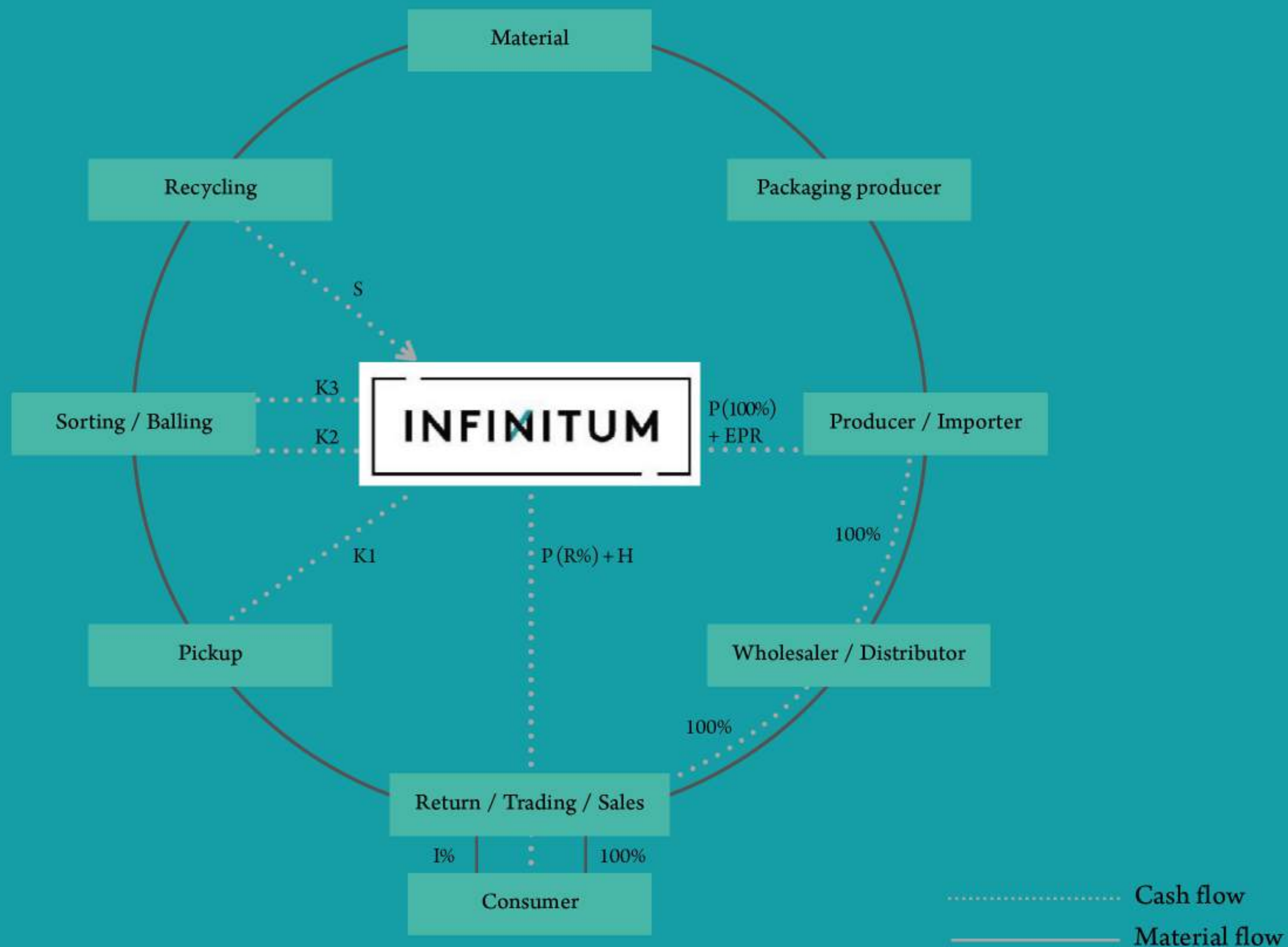
<1 % Company's with
internet sales of grocery
og beverage



According to the regulations - all outlets selling beverage with deposit is obliged to accept deposit bottles/cans and disburse deposit as cash!



MATERIAL- AND CASH FLOWS



- P: Deposit
- EPR: Epr. fee (pr. unit)
- H: Handling fee
- K1: Purchase of pick-up service
- K2: Cost of handling and bailing
- K3: Purchase of transport to recycle
- S: Sales of collected material
- I% The collection rate

Unredeemed deposit accrues to Infinitem



EPR COST PRODUCER/IMPORTER

<i>01.10.2018</i>	<i>Aluminium</i>	<i>Steel</i>	<i>PET</i>	<i>HDPE</i>
<i>Basis EPR</i>	<i>-NOK 0,08</i>	<i>NOK 0,21</i>	<i>NOK 0,10</i>	<i>NOK 0,10</i>
<i>Light blue</i>			<i>NOK 0,08</i>	<i>NOK 0,08</i>
<i>Colored or sleeve > 75 %</i>			<i>NOK 0,15</i>	<i>NOK 0,15</i>
<i>Sleeve eller label</i>	<i>NOK 0,03</i>	<i>NOK 0,03</i>		

Infinitum NOK 2,8 per kg PET



EPR COST PRODUCER/IMPORTER

Tabell vederlag i Europa:

Land	Retursystem	Vederlagssats (NOK/kg) i 2020
Østerrike	Ara	All plast: 6,95
Belgia	Fost Plus	Pet: 2,46 HDPE -flasker: 3,58 Annen plast: 7,11
Sverige	FTI	Fra 3,26 til 4,91***
Nederland	Avfalfonds Verpakkingen	Fra 3,60 til 6,00***
Spania	EcoEmbres	Hardplast: 3,77 Pet: 4,33 Folie + annen plast: 7,39
Italia	Conai	Fra 2,08 til 3,69***

***Landene har differensiert vederlag på plast (økomodulering), avhengig av materialgjenvinnbarhet. God gjenvinnbarhet betyr lavest pris, ikke/vanskelig gjenvinnbarhet betyr høyest pris.



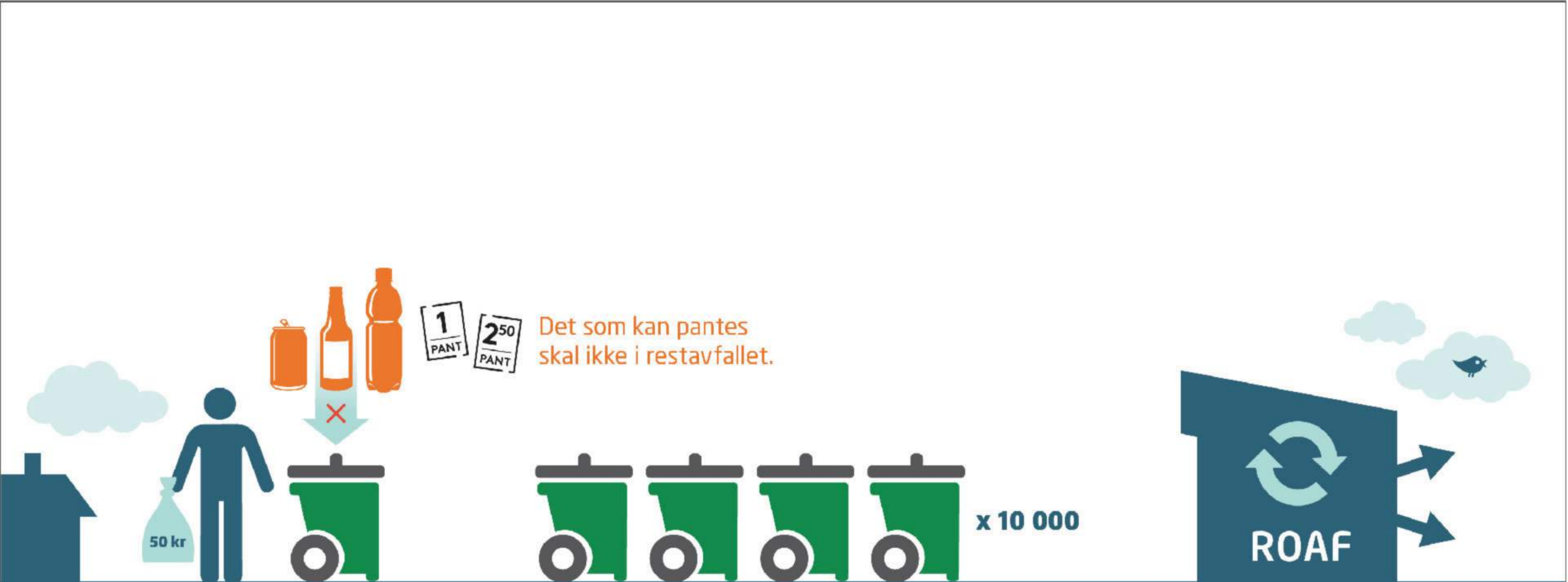
DEPOSIT AND COLLECTION 2019

Supply chain	No. of cans	Tonnes of cans	% of added	No. of PET	Tonnes of PET	% added to the market
Total sales	684,093,737	9,478	-	619,262,956	22,323	0%
Value chain	-14,079,824	-180	-	10,631,013	405	0%
Added (sales + value chain)	670,013,913	9,297	100%	629,893,969	22,728	100%
Total returned through reverse vending machines	598,643,369	8,324	89.5%	556,570,503	20,316	89.4%
From central sorting plant	5,328,154	74	0.8%	1,132,496	39	0.2 %*
From slag sorting	40,832,520	566	6.1 %	-	-	0.0 %*
From materials sorted at source	4,595,052	61	0.7 %	1,329,523	44	0.2 %*
Waste-to-energy	9,664,485	134	1.4 %	42,228,252	1,343	5.9 %
Total recycled from waste	60,420,211	835	9.0 %	44,690,271	1,426	6.3 %
Total recycled	659,063,580	9,159	98.5 %	601,260,774	21,742	95.7 %
Incineration waste in bottom ash	13,610,840	189	2.0 %	-	-	-
Energy recycling incineration	1,884,106	26	0.3 %	7,536,117	236	1.0 %
Unknown allocations	-4,544,613	-76	-0.8 %	21,097,078	750	3.3%**
Total not returned	71,370,544	973	10.5 %	73,323,466	2,412	10.6%
Total	670,013,913	9,297	100%	629,893,969	22,728	100%
Foreign items	36,729,975			5,854,506		



- environment benefits compared to the curbside system (example of ROAF)

COST EFFICIENT COLLECTION
LOWEST CARBON FOOTPRINT



Det som kan pantes skal ikke i restavfallet.

x 10 000

ROAF

En hustand på to personer kaster i gjennomsnitt 50 kroner pant rett i restavfallet hvert år.

Det ekstra volumet fører til at vi hvert år tømmer ca. 40 000 beholdere helt unødvendig.

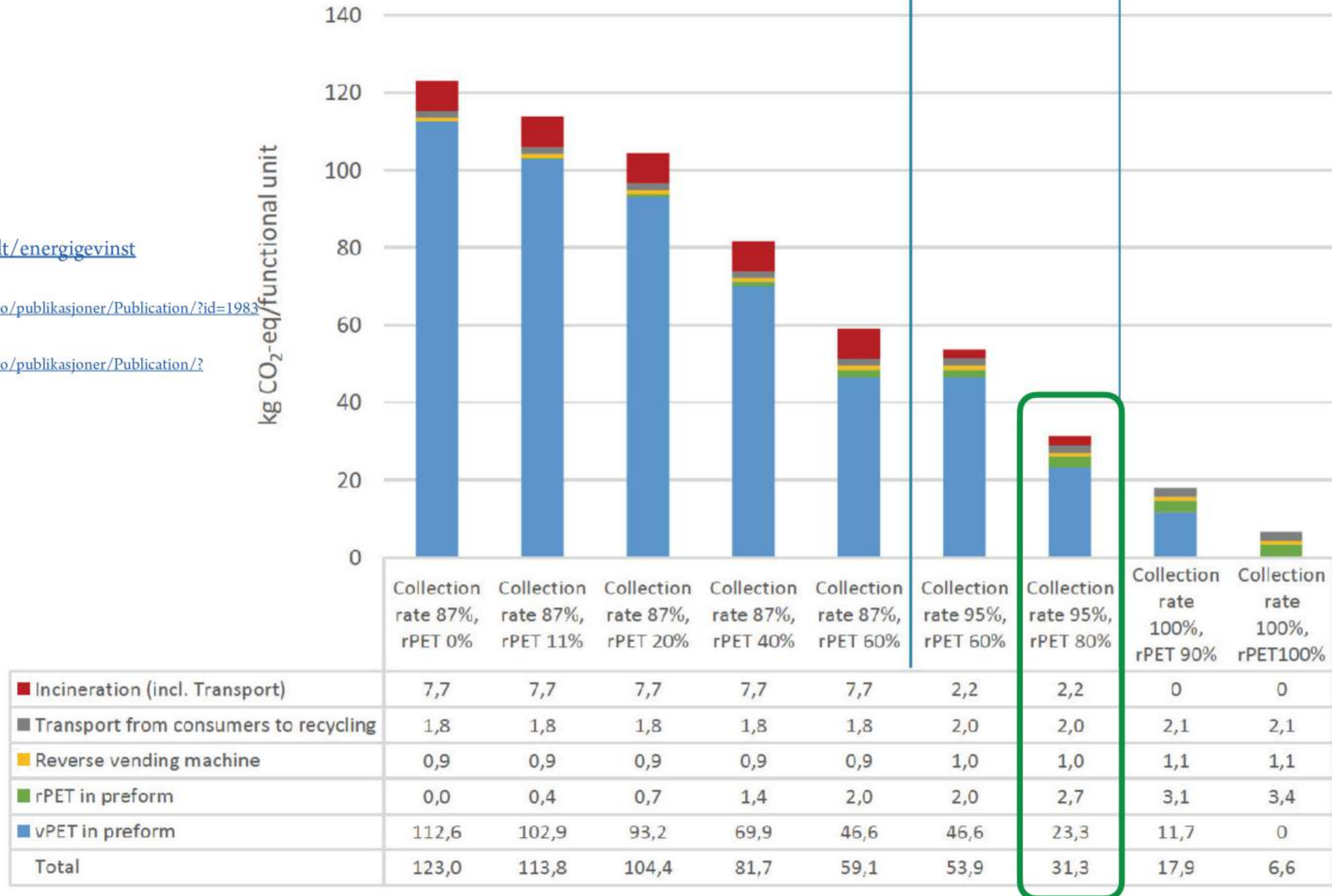
Grovt anslått går det 5 millioner tapte kroner gjennom sorteringsanlegget til ROAF hvert år.



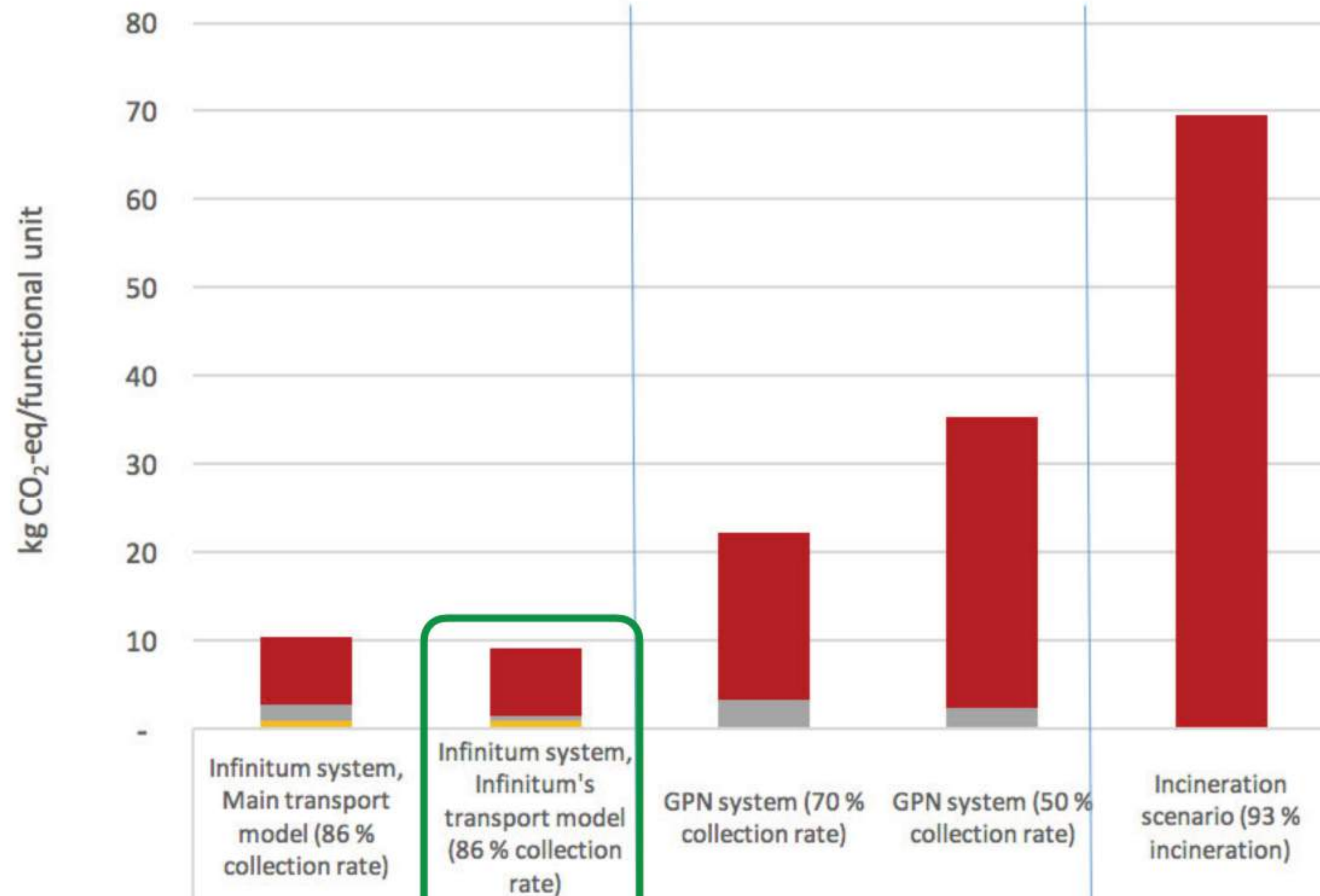
<http://ininitum.no/aktuelt/energigevinst>

<https://www.ostfoldforskning.no/no/publikasjoner/Publication/?id=1983>

<https://www.ostfoldforskning.no/no/publikasjoner/Publication/?id=2031>



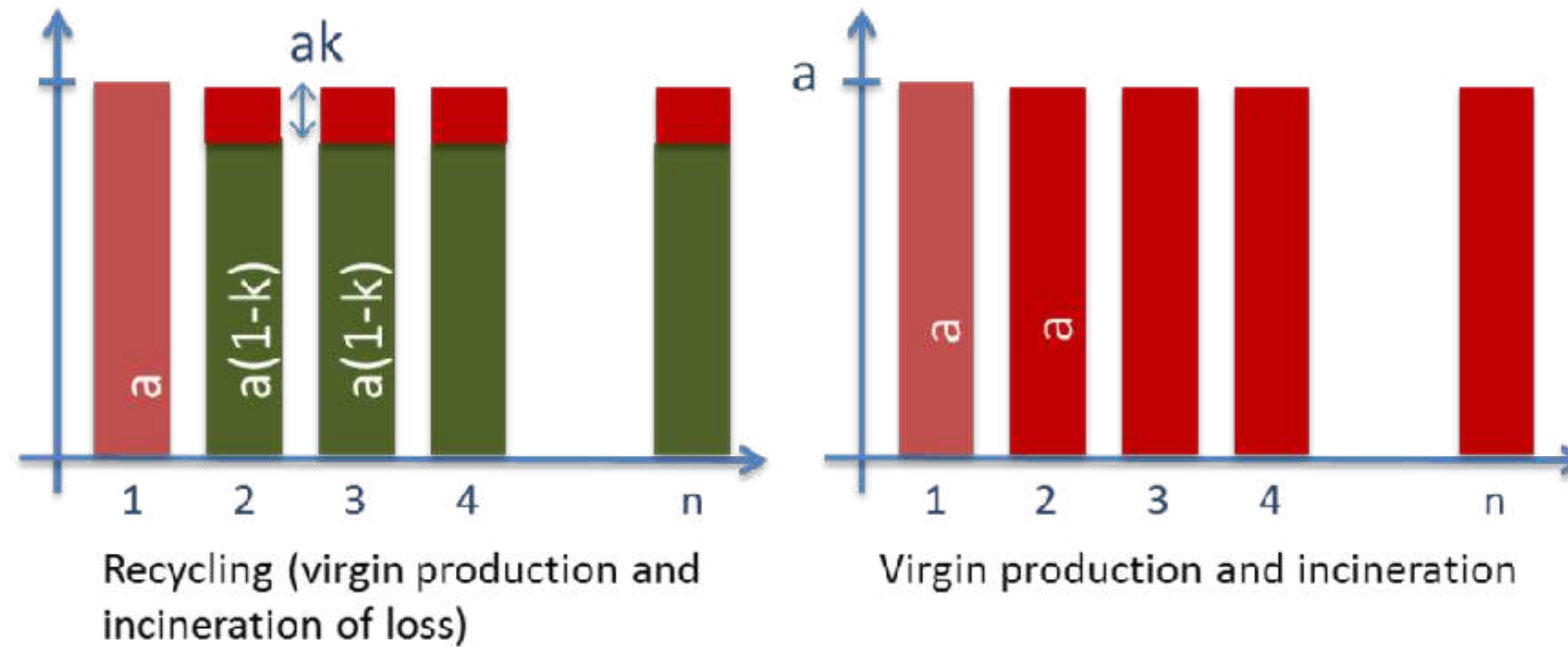
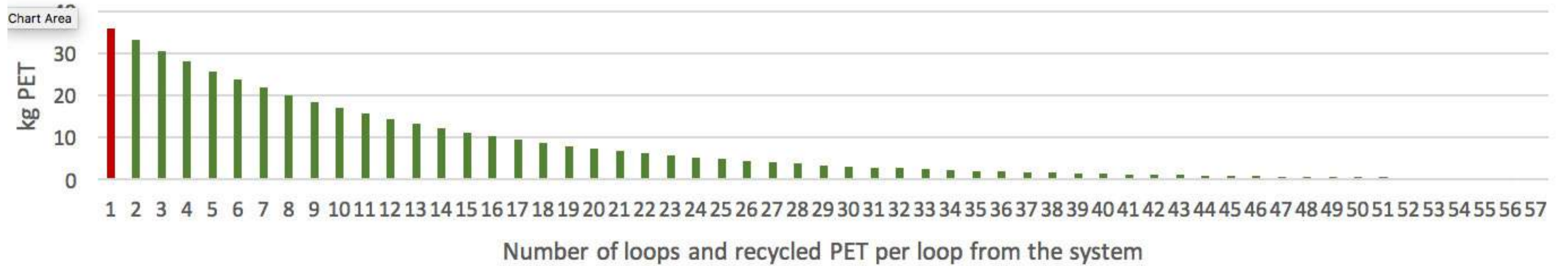
Figur 4: Klimagassutslipp per funksjonell enhet (produksjon, innsamling og behandling av PET flasker benyttet til distribusjon av 1000 liter drikkevarer) for optimaliserte scenarier for Innitums system for PET- flasker.



■ Incineration (incl. Transport)	7,70	7,70	18,83	32,98	69,47
■ Transport from consumers to recycling	1,81	0,59	3,38	2,42	0,00
■ Reverse vending machine	0,94	0,94	0,00	0,00	0,00
Total	10,45	9,23	22,21	35,39	69,47



DEPOSIT AGAIN AND AGAIN AND AGAIN AND ... !





Annual saving of **2 640 GWh** when using PET bottles instead of glass bottles!

Equivalent to annual energy consumption of 1.1 million Tesla cars



CO₂ EMISSION FOR BEVERAGE 1000 L

Vinmonopolet:

Glass bottles (0,75L): 875 kg

Bag-in-box (3L): 159 kg

Carton (1L): 138 kg

PET with deposit:

0% recycled PET (1 L): 123 kg

100% recycled PET (1 L): 6,6 kg

Cans with deposit:

100% recycled alu (0,45 L): 100,8 kg

20% recycled alu (0,45 L): 800,4 kg



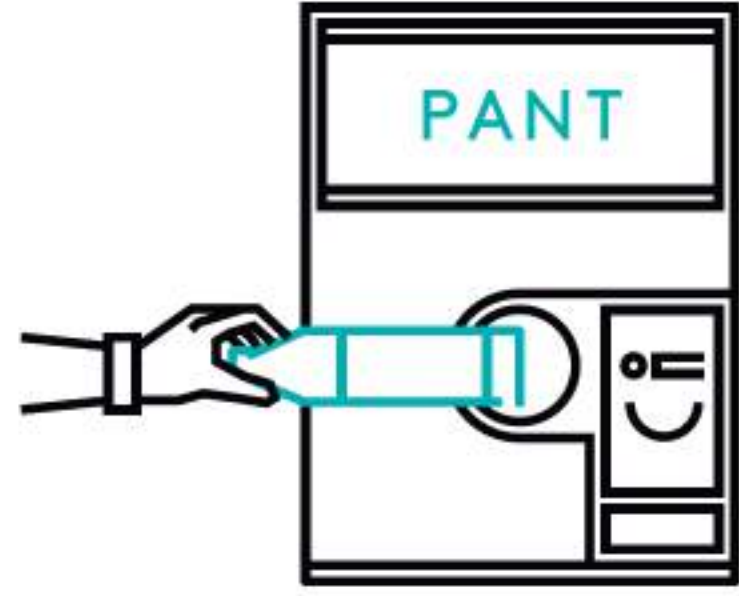
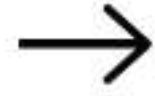
THE “NORWEGIAN MODEL”

- Environmental cost modell
- 100 % producer responsibility
- Product price + deposit (deposit not included in the product price)
- Deposit without VAT
- All selling points i obliged to take back the empties and pay out the deposit
- No restriction on content
- Centralized clearing with Infinitum, solidarity
- Balanced ownership, value chain approach
- Design for recycling – bottle to bottle

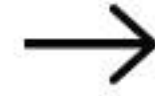




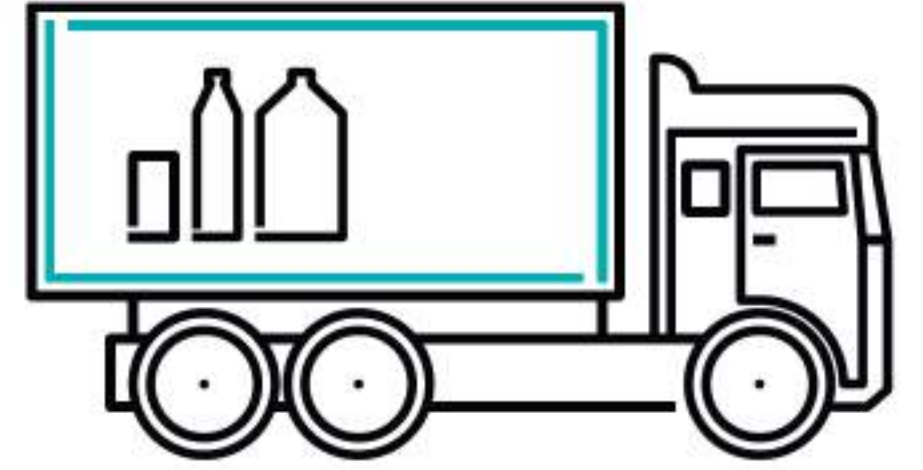
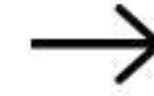
Happiness



Pant



Preparation



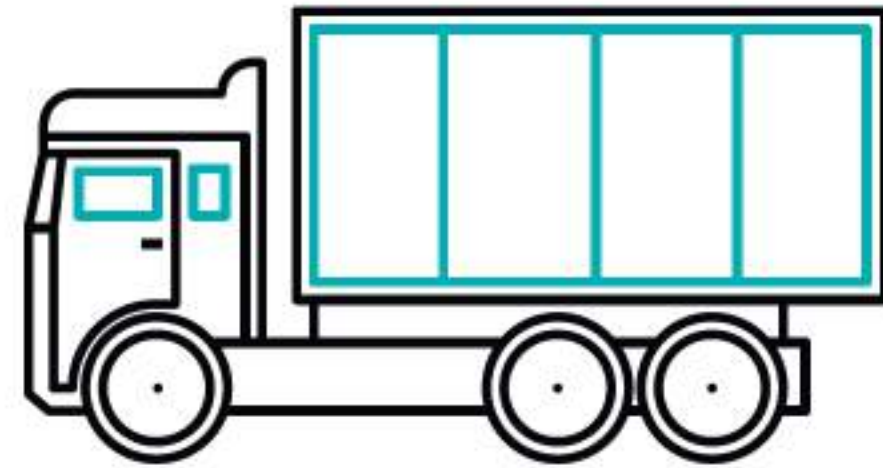
Pick up



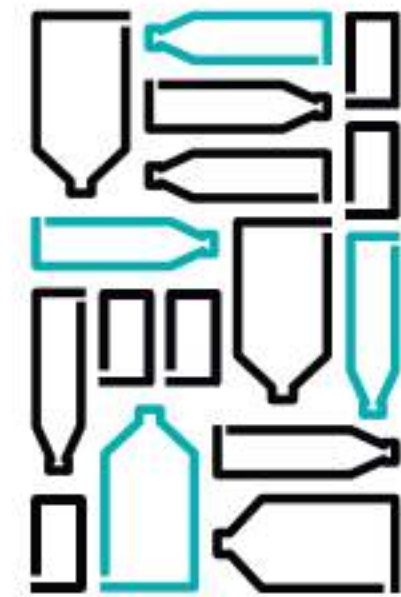
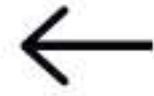
INFINITUM



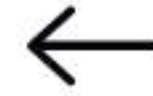
High grade recycling



Transport



Sorting and bailing



Transport



**1,9 Billion environmental
acts in a year**



Suomen Palautuspakkaus (Palpa) in brief

- Established in 1996
- Deposit refund systems for cans, PET bottles and one way glass bottles
- Private, non-profit company
- Ownership
 - 50 % Beverage industry
 - 50 % Retailers
 - Owners are treated equally with other members, no financial benefits
- Turnover ~80 M€
 - Deposits not included
- 14 employees
- Palpa's strategy is run the return systems by network of companies and outsource all operations

Recycling is part of our nature

On average each Finnish citizen returns Palpa packages in a year:

234

Beverage cans



89

Plastic bottles



25

Glass bottles



348

Total packages
in a year

Palpa return systems 2019



	Aluminium can	PET bottle	One Way Glass bottle	Total
Return rate	95 %	90 %	87 %	93 %
Deposit value	0,15 €	0,10 € (0 – 0,35 l) 0,20 € (0,36 – 0,99 l) 0,40 € (> 1 l)	0,10 €	
Return volume	1.3 Bn	490 M	138 M	1.928 Bn
Materials recycled	18.500 tn	14.200 tn	54.500 tn	87.200 tn
Deposit products	2.453	2.968	17.343	22.764
Memberships	91	122	187	Nbr of companies: 263

Other data 2019

- 350 M€ worth deposits managed
- 4.600 retail and 9.500 horeca collection locations
- 2.347 new products registered
- ~4.000 RVMs in ~3.000 retail locations
 - Can returns: 99,5% RVM
 - PET returns: 98,5% RVM
 - Glass returns: 74% RVM (26 % horeca)

Package recognition and material recycling

- Package recognized based on barcode and package dimensions/shape
 - To secure correct payment to consumer
 - To support early sorting of material
 - To make sure that system costs are correctly allocated to different return systems and companies
- Material requirements agreed together with material recycling companies
 - Container body
 - Label
 - Glue
 - Ink

Transportation and operators

Collecting transportation

- Backhaul (mostly producers and retailers)
- From retail stores/horeca to transporters'/retailers' terminals (150)

Frame transport

- From transporters' terminals to operators' plants (8)

Can/PET baling at operator plants

Emptying service (glass)

- Directly from retail stores (1400) and horeca points (1000) to operators' plants (aluminium/pet/glass) or to glass recycler in Finland

Material delivery to recyclers directly from the operators

- Aluminum cans (18.500 tn)
- PET bottles (14.200 tn)
- Glass bottles (54.500 tn)

- Operator plant
- Operator plant with counting device



1300 km

340 000 km²

Population 5,5 M



Based on governmental steering

- Packaging tax for certain beverages
 - Importers and producers have to pay packaging tax of 0.51 € / ltr for packages in customs tariff group CN 22 (e.g. waters, soft drinks, all alcohols)
 - Importer or producer is tax exempt if the company and the products are registered in deposit return system
 - 97 % of liters sold are in deposit system
 - Joining in return system is not mandatory
- Waste law
 - Retailer selling products belonging to deposit system is obliged to receive empty deposit containers from consumers



Financing the recycling systems

- Revenues come from material sales, unredeemed deposits and recycling fees
 - Recycling fees are paid by beverage producers and importers
- Costs are collection logistics, material handling, handling fees to retail, fixed costs
- All the fees are based on real costs

Other materials

Palpa video

- <https://www.youtube.com/watch?v=rNwAm01Dm-g>

Waste law

- <https://www.finlex.fi/en/laki/kaannokset/2011/en20110646.pdf>
- Chapter 7, page 28

Government Decree on a return system for beverage containers

- <https://www.finlex.fi/en/laki/kaannokset/2013/en20130526.pdf>
 - E.g. minimum deposit values, recycling targets

Return system for refillable glass bottles

- <https://www.ekopullo.fi/en/>



www.palpa.fi

tommi.vihavainen@palpa.fi



Lithuania's Deposit System

Public institution

Užstato Sistemos Administratorius

USAD



Deposit system management

A public institution *Užstato Sistemų Administratorius (USAD)* is a non-profit organization that has an underlying objective of managing the deposit system as indicated in Law on Packaging and Packaging Waste

- Founded and managed by directly involved industries
 - › Lithuanian Brewers Association
 - › Association of Lithuanian Trade Enterprises
 - › Lithuanian Natural Mineral Water Manufacturers' Association

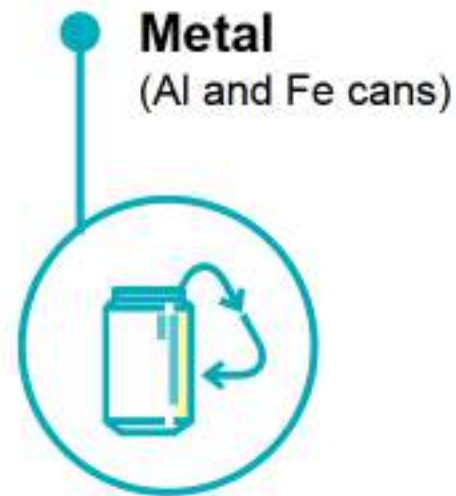


Deposit system scope

01/02/2016

Mandatory deposit system for beverage packages launched in Lithuania

Beverage packages types in the mandatory deposit system (capacity from 0,10 to 3,0 litre):



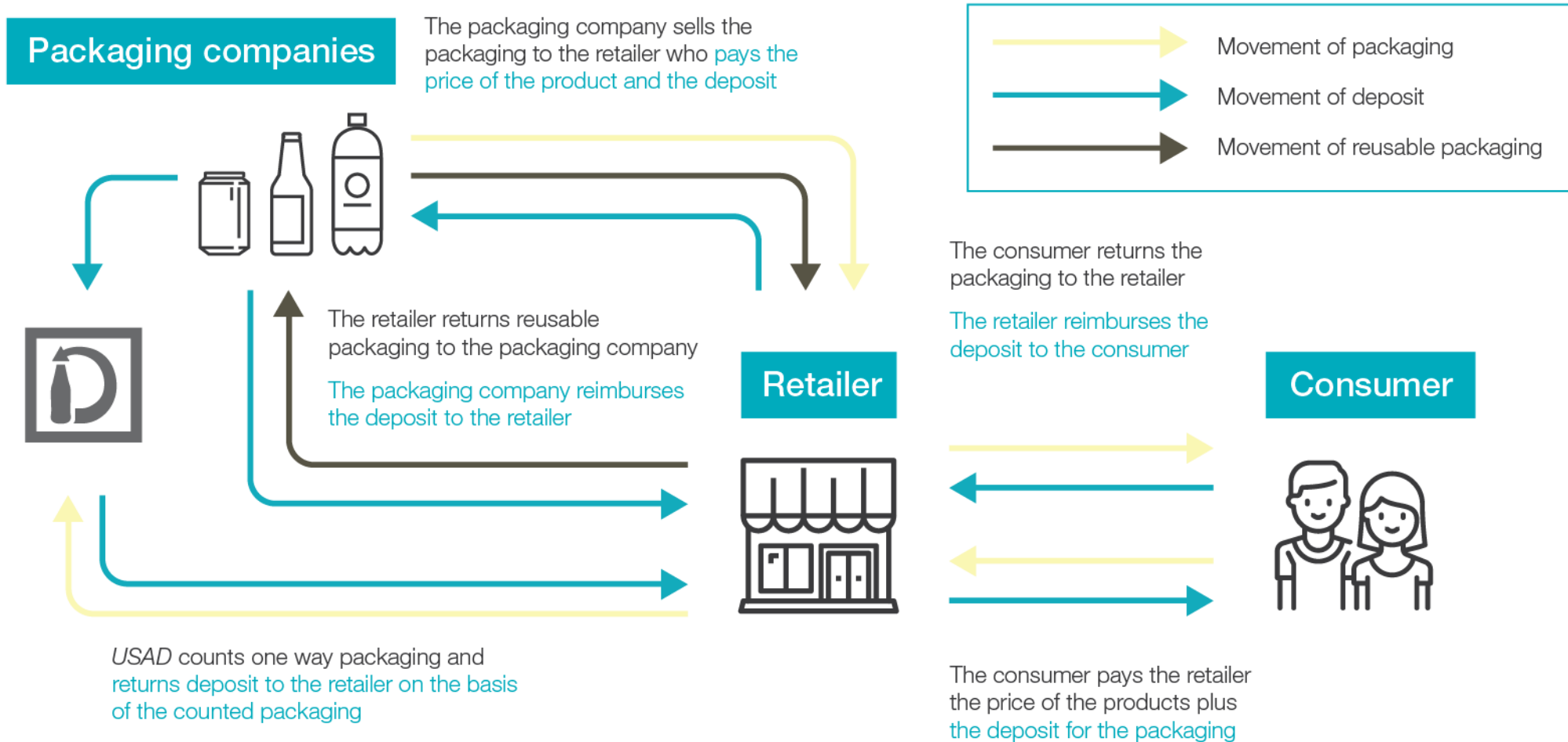
Deposit system scope

Beverage categories in the mandatory deposit system:

- › Beer, Beer mixes
- › Cider, Pear cider
- › Other fermented alcohol drinks and mixes
- › Non-alcoholic drinks
- › Water
- › Juices and nectars

*Annual volumes ~660 mln
beverage containers*

How does everything work?



Deposit system infrastructure

- Amount of collection points and their types:

Reverse vending machine (RVM) points –

close to 1.000

Manual collection points –

over 1.700

Total 2.700

In total over

1.100

RVMs installed

89%

of packages
are collected
in RVM points



Producers obligations



Marking deposit packages with **deposit logo**



Charging deposit for each sold deposit package



Choosing type of **barcode**: universal or unique



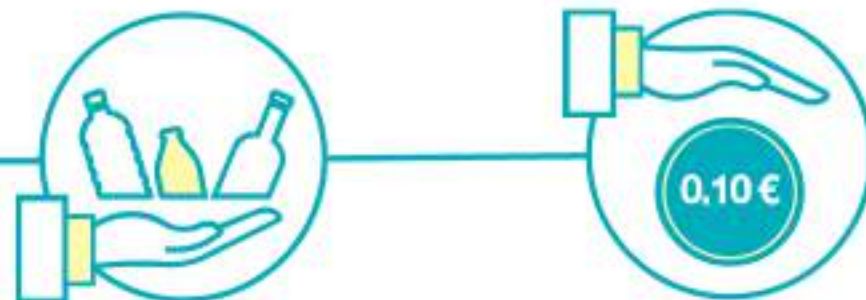
Participating in deposit system and **financing** it

Retailers obligations

- Taking deposit from consumers

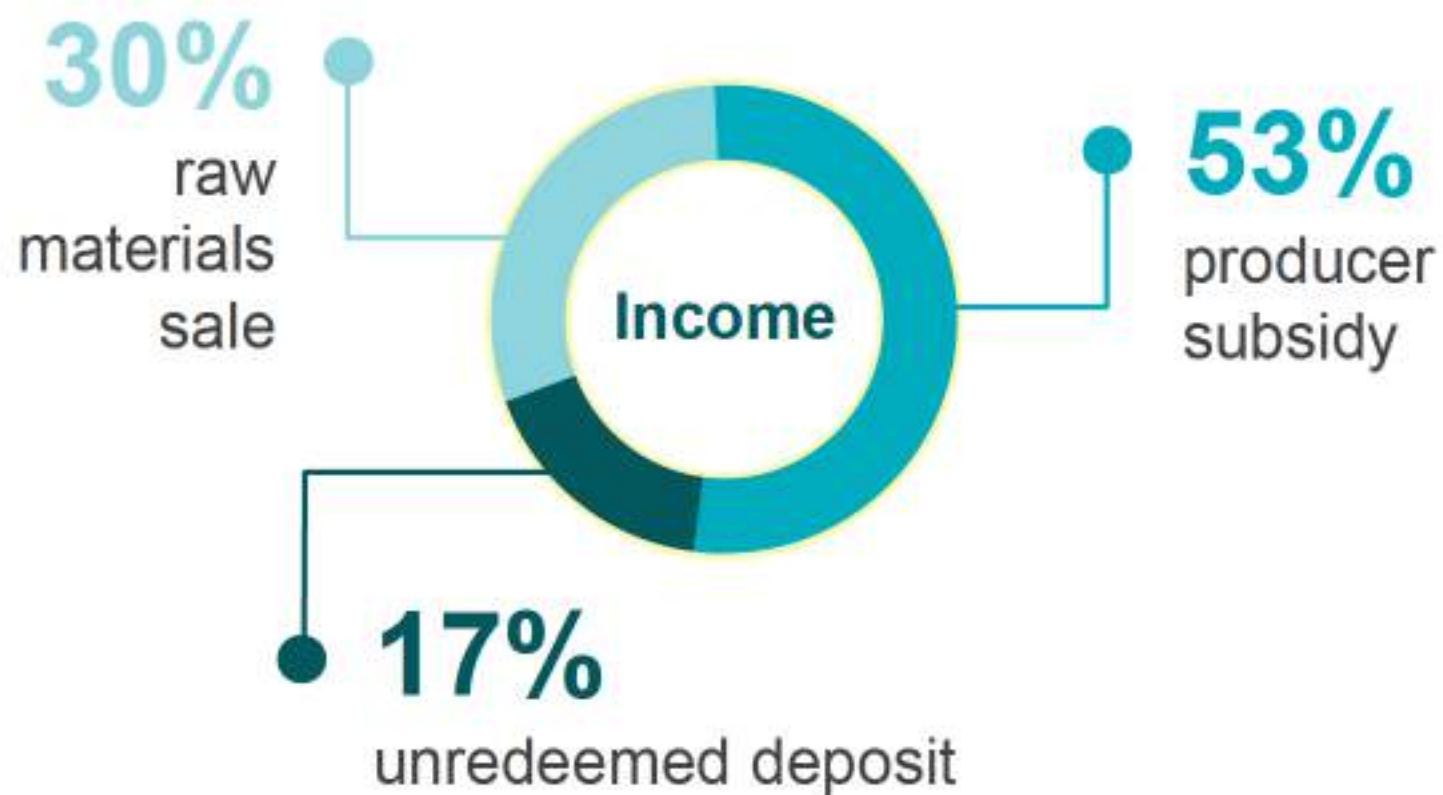


- Taking back deposit packages from consumers and returning deposit

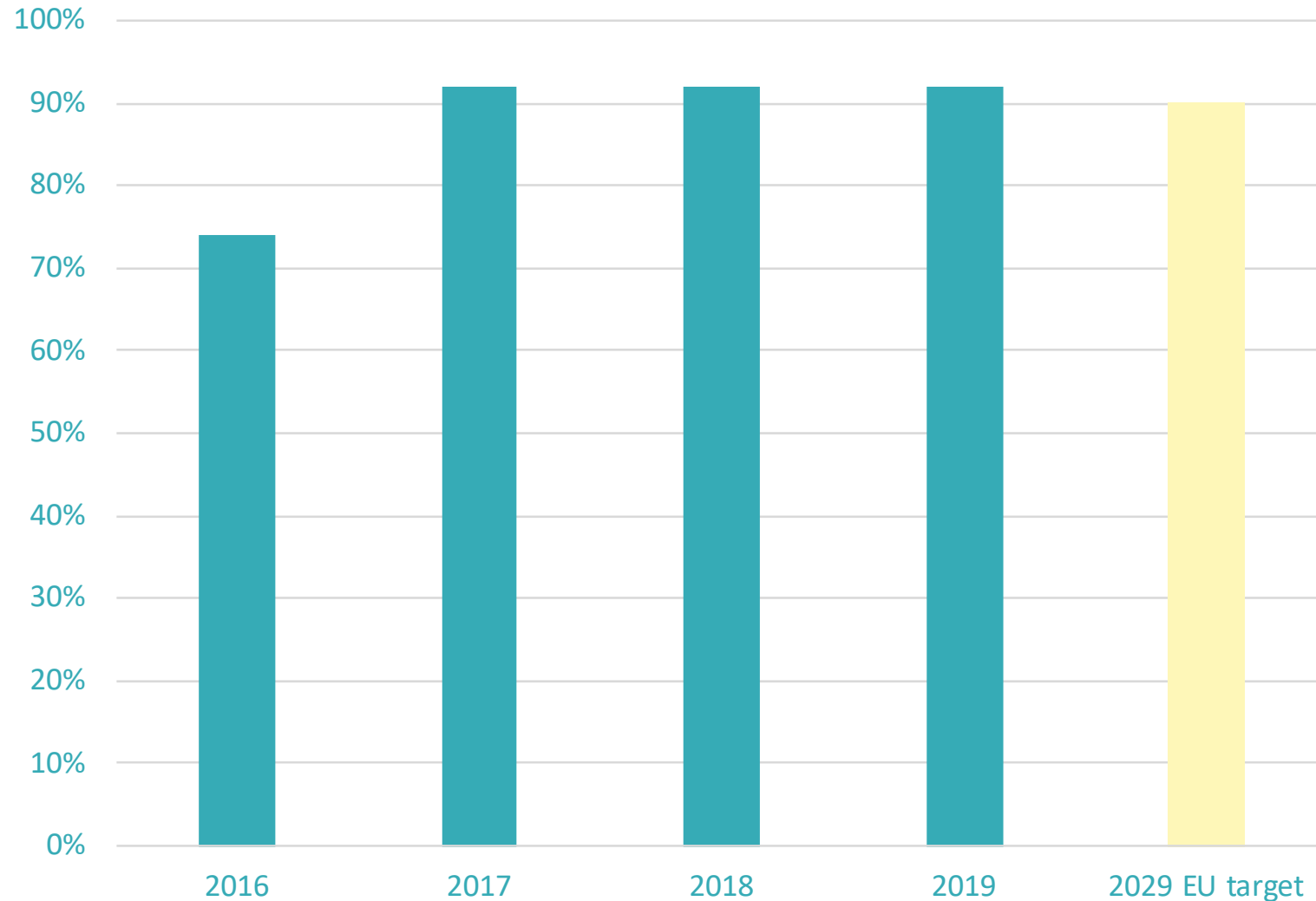


System revenues

Producers and importers are the main sponsors of the deposit system



Collection & recycling results



Targets for **2029** are already **achieved and exceeded**

Deposit system allows higher recycling targets vs. container system

Before deposit system introduction PET bottles recycling **was below 33%**

Collection & recycling results

In the first 4 years we collected:

2.100.000.000
beverage containers



80.000
tones



8 Eiffel towers

Recycling volumes:

2016 – 16.000 tones 2017 – 20.000 tones 2018 – 21.000 tones

2019 – 23.000 tones

Collection & recycling quality



• **100%** collected materials
are **recycled**



A very high quality
of collected materials –
• **clean and well sorted**

***Easy to recycle back to
the bottles and cans***

What do consumers think?

Consumer survey conducted in 2018* resulted:

**2 years after launching the deposit system*

97% of consumers answered that they are

satisfied

in general with functioning of the deposit system for single-use packaging



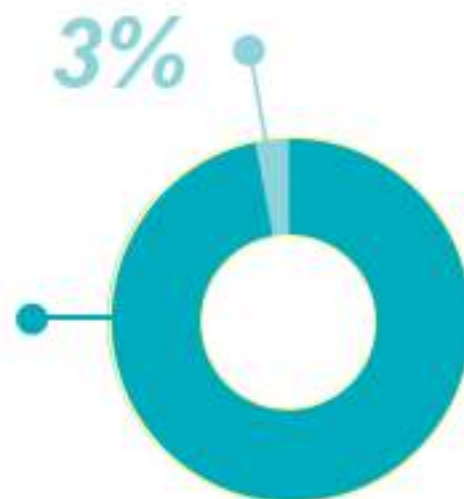
95% of consumers indicated that the **amount of garbage** in parks, at lakes and other natural places, visited by people, **decreased** after introduction of the packaging deposit system

What do consumers think?

Consumer survey conducted in 2018* resulted:

**2 years after launching the deposit system*

97% of consumers claimed that the **deposit system is necessary**



Even more importantly:



93% of consumers admitted that introduction of the packaging deposit system encouraged them to regard sorting out of all-type waste with **more responsibility**



Thank You!

www.grazintiverta.lt

A large, light blue graphic on the right side of the slide. It features a stylized bottle shape on the left and a large circular arrow on the right, both rendered in a simple, rounded style. The background of the slide is a light yellow color.

Viešoji įstaiga Užstato sistemos administratorius

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DEPOSIT RETURN SYSTEM



EESTI
PANDIPAKEND

Kaupo Karba
CEO
11.03.2020

 /eestipandipakend

ILUSAT HOMSET

Collection systems

DEPOSIT RETURN SYSTEM



CONTAINER



CURBSIDE



PACKAGES BAG



EESTI
PANDIPAKEND

[/eestipandipakend](https://www.instagram.com/eestipandipakend)

ILUSAT HOMSET

Deposit return system

PROS+

- ♻️ **80-98%** of packages put to the market are collected
- ♻️ Extremely clean and high quality material, **100% recyclable** (*upcycling*)
- ♻️ High littering (incl marine littering) risk packages taken under control
- ♻️ **Very fast results** due to monetary incentive
- ♻️ Non-environmental friendly consumers contribute and get educated
- ♻️ **Transparent data** and reporting

CONS-

- ♻️ Potential consumer/producer/retailer fraud, needs detailed controlling logics
- ♻️ Stakeholders (producer, retailer) management
- ♻️ Simple logic for consumer, but complex “kitchen side”



How the DRS works?

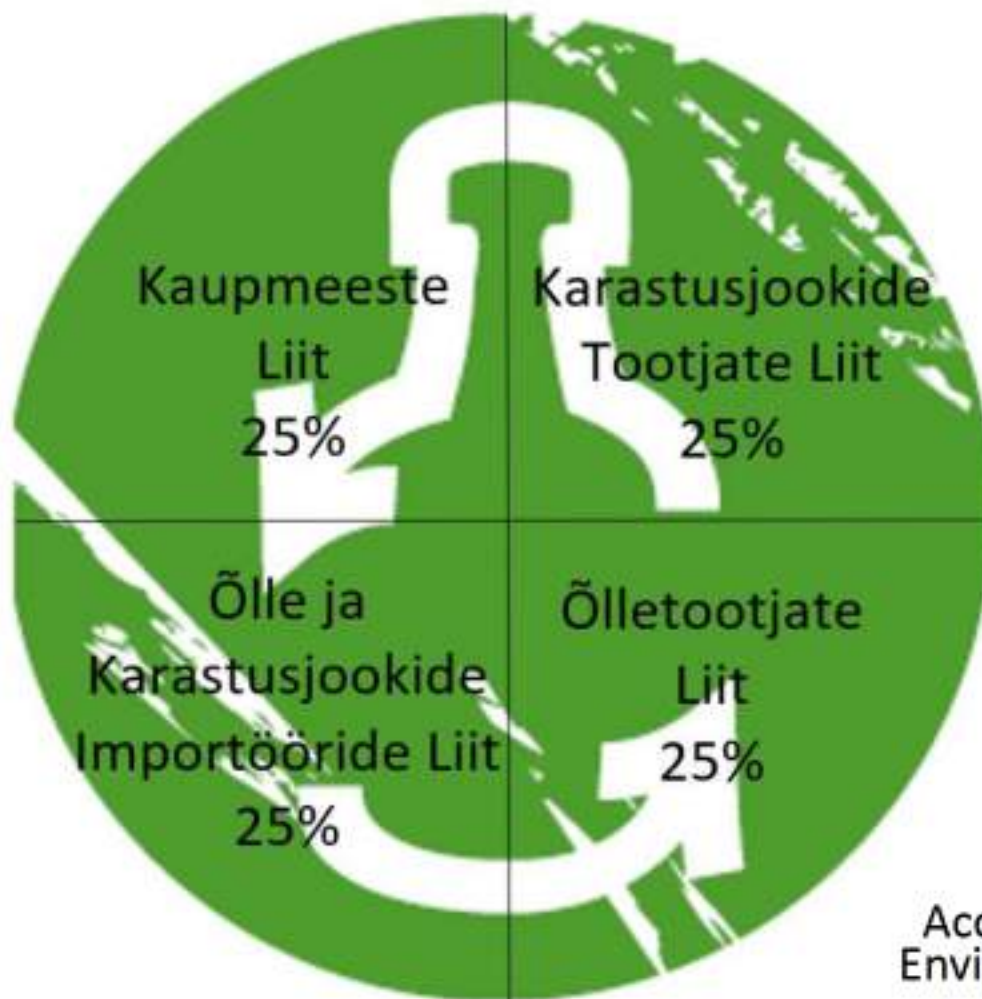


Deposit does not raise the price of the product, but it is a separate price component that the consumer returns when he returns the package

DEPOSIT SYSTEMS IN EUROPE



EESTI PANDIPAKEND



Accredited by Ministry of Environment since 03/2005

Operating from 05/2005

Involvement of the deposit return system



PRODUCERS/IMPORTERS

📄 349

Packages registered in the packaging register:

📄 16000 packages (since 2005)

📄 ~5500 active packages



RETAILERS

📄 820 collection points

(manual or automated)

📄 sh 570/730 reverse vending machines (RVM)

Horeca:

📄 420 pick-up points

Product categories and materials

Products categories under deposit:

- Soft drink
- Water
- Beer
- Cider, perry
- Low-ethanol alcoholic beverages
- Juice, juice concentrate, nectar

Packages under deposit:

- Plastics (PET) 0,10
- Metals (CAN) 0,10
- Glass (oneway and refillable) 0,10

deposit value (EUR)



Collection structure

- ↻ Reverse vending machine (RVM)
- ↻ Manual collection

In 2006

- ↻ 80% manual collection
- ↻ 20% RVM

Since 2015

- ↻ 6% manual collection
- ↻ 94% RVM (80% compacted)

The CO2 footprint decreases up to 4 times



Deposit packages collection in Estonia

Oneway packages	2019 (2018)	Min requirement by excise law
Sales, million peaces	299 (277)	
Returns, million peaces	252 (240)	
PET return	87,1% (85,6%)	85%
CAN return	89,0% (97,4%)	50%
OWG return	88,5% (92,2%)	85%

A total of over **4.0 billion deposit packages collected** and recycled/reused (as of 02.2020)

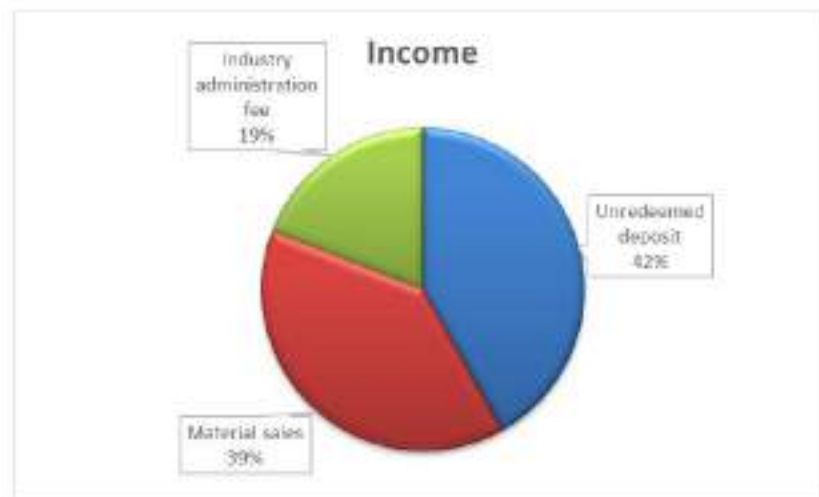
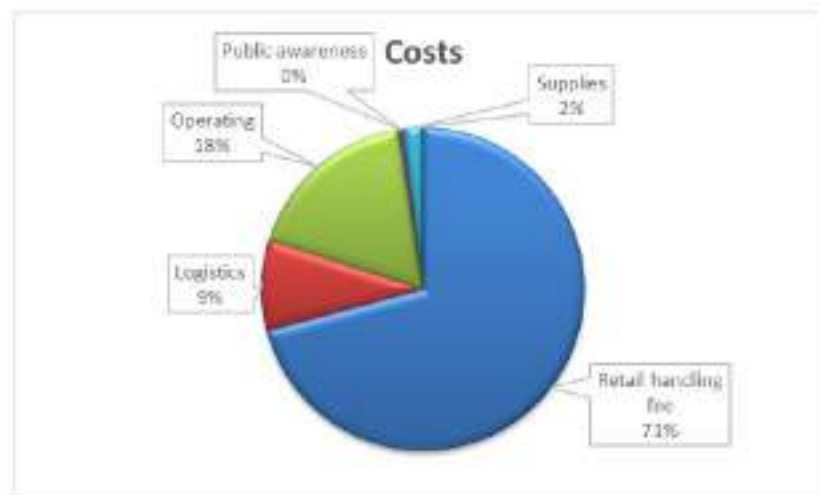
Financial model (Estonia)

Costs

- 🔄 Retail handling fee
- 🔄 Logistics
- 🔄 Operating (handling center and administration)
- 🔄 Public awareness
- 🔄 Supplies

Income

- 🔄 Unredeemed deposit
- 🔄 Material sales
- 🔄 Industry administration fee



Keys to a successful deposit return system

- 👤 **Non-profit principle**
- 👤 **Correct initial setup** – law, handling/baling centres, logistics, etc
- 👤 **Stakeholders involvement** – producers, retailers
- 👤 **Controlling**
- 👤 **Constant awareness building** towards public and stakeholders

Have a beautiful tomorrow!

Mr. Kaupo Karba
kaupo@eestipandipakend.ee

reloop

what we waste

Tracking 20 years of growth in
international drinks container wastage,
and how refillables and deposit return
systems can reverse this trend





Authors

Jason Wilcox
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Supported by

Changing Markets Foundation

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reloop

ReLoop is an international non-profit organisation that brings together industry, government and NGOs who share a vision of a thriving global circular economy - a system where resources are kept in continuous use and waste and pollution are eliminated. Our broad network seeks to bring about positive change at all levels of resource and waste policy.



The Changing Markets Foundation was formed to accelerate and scale up solutions to sustainability challenges by leveraging the power of markets. Working in partnership with NGOs, other foundations and research organisations we are keen to explore effective solutions to the plastic pollution crisis. This is why we also supported this independent report.

Foreword

Reloop believes in smart policy. We want our research and analysis to inspire policymakers to develop regional and national policies that create space for proven and innovative solutions.

Circular economy policies deliver critical benefits to society, such as an increase in jobs and a significant contribution to climate change strategies, alongside ensuring that resources remain resources.

As part of Reloop's core focus on packaging, we have now studied data on the sales and recycling rates of drinks containers from 93 countries over a 20 year period. We discovered that there is a stark difference between the outcomes for countries that do have smart policy and those that don't.

In this report you'll find the story of how single use plastic, metal and glass beverage packaging is being wasted at ever-increasing rates around the world – with wastage defined as landfilled, incinerated or lost to the environment as litter. It is a story which is particularly concerning in countries with inadequate waste management systems.

But there are countries who are leading the way, showing us that there are circular economy models for managing reusable and recyclable resources – models which collect the most material and ensure the best quality for refill or closed-loop recycling.

Ultimately, the report shows us that waste reduction and proper resource management strategies should be deployed immediately at a global level.

We're excited to share this compelling report with you. We believe it should spark conversations across the political, business and community spheres; conversations that ultimately should lead to positive policy change.

Finally, we are grateful to the Changing Markets Foundation for financially supporting this work and to Break Free From Plastic for working with us to reach countries and regions in which it operates.

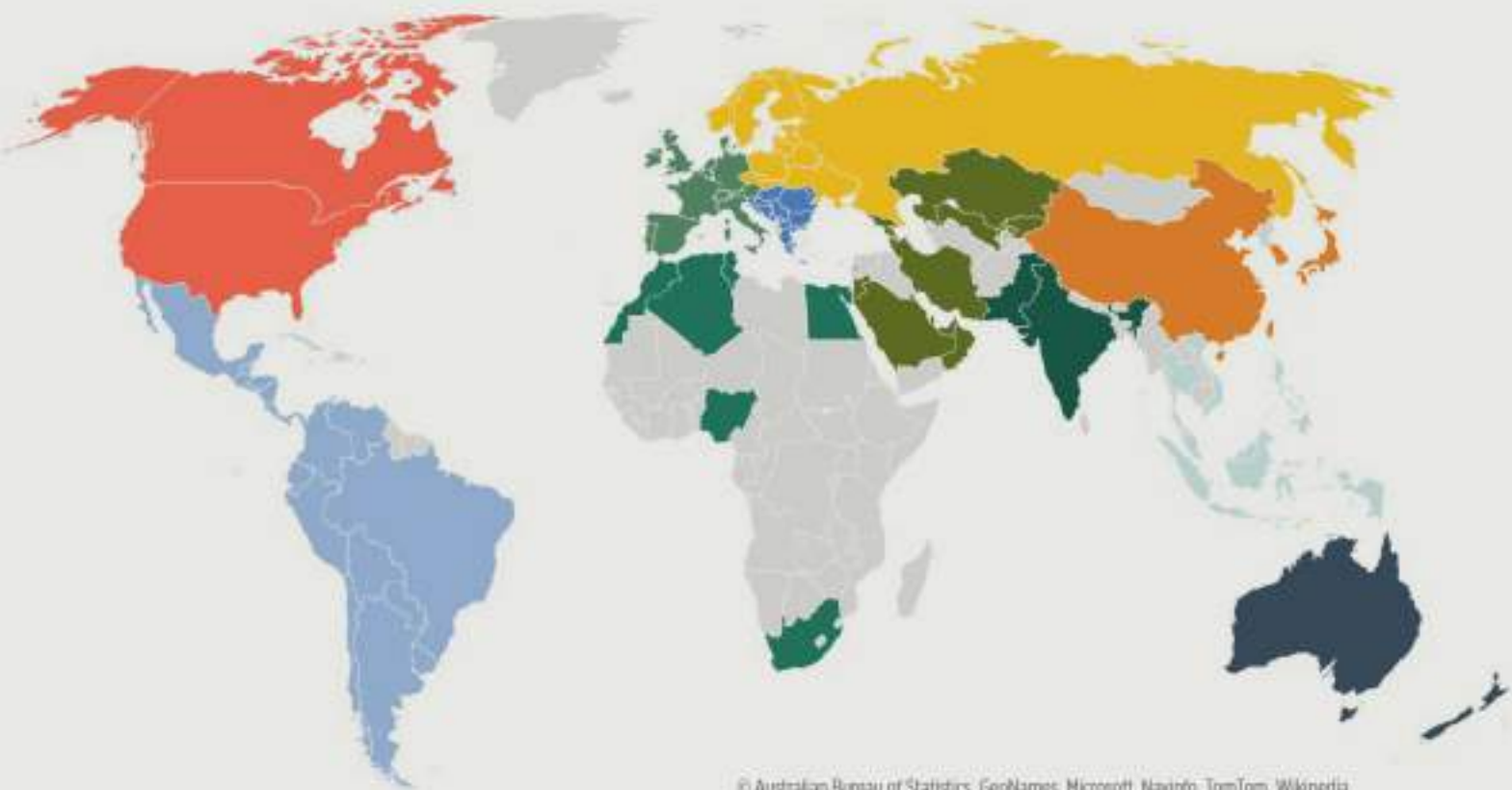
Clarissa Morawski
CEO & Co-Founder, Reloop



Circular economy
policies deliver
critical benefits
to society.



Technical overview



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This report draws on data from 93 countries, some of it dating back to 1999, to examine trends in sales, collection and wastage of drinks containers, where wastage is defined as containers ending up in landfill, incineration, or in the environment. The countries included comprise 81% of the world's population as at 2019.

In particular, it considers the relationship between wastage rates and the beverage industry's shift from refillable bottles to single-use drinks packaging, alongside the impact the implementation of a deposit return system can have, both on wastage and on supporting the share of refillable bottles on the market.

The sales data for the 93 countries was purchased by Reelooop under licence from GlobalData. Of those countries, complete datasets showing sales of all ready-to-drink beverages was available for 66 of them. For 27 countries (mostly in the Western Asia/Middle East region), data was available for all beverage categories except beer and cider. Under the terms of that licence we cannot republish raw sales data, but we can use it comparatively and in conjunction with other datasets. This includes some or all recycling rate data across a smaller subset of countries, including 24 EU member states, three other European countries, North America, Indonesia, Malaysia, Philippines, South Africa, Thailand and Vietnam.

These datasets allow us to explore market share by material and by drinks segment, to look at the history of changes to refillable market share and the uptake of deposit return, and to estimate the effects in particular countries if refillable market share could be increased or deposit return adopted.

Introduction

Over the period covered by this dataset for global beverage sales, from 1999 to 2019, the countries covered saw a substantial increase in the volumes of ready-to-consume beverages sold.

When the first data in this set appears, in 1999, it shows that 685 billion drinks were sold in metal cans, in plastic or glass bottles, or in board/cartons.

By 2019, this figure had almost doubled to 1.3 trillion. This dataset does not cover approximately 100 countries, and other methodologies estimate the full global figure to be [2 trillion in beverage sales](#) for that same year.

The primary packaging materials covered by our sales dataset are glass bottles, both single-use and refillable, PET bottles (polyethylene terephthalate, the plastic typically used for water and carbonated beverages, which are largely but not always sold on a single-use basis), and steel or aluminium cans, which can of course be recycled but not refilled. Our sales data also covers HDPE bottles (high-density polyethylene) and board (including cartons, such as Tetra Pak), but these two materials are not included in our recycling datasets.

There are two primary datasets used here: beverage sales rates from 1999 to 2019, from GlobalData, and national datasets covering the recycling rates of the materials listed above. Other data sources include Reloop's [Global Deposit Book](#), World Bank, and others as identified.

It should be noted that with recycling rates there is often a lack of clarity between “materials collected” and “materials recycled”. The common approach, particularly in systems that recover dry mixed packaging for recycling from the kerbside, is for the weight of the packaging collected, including contaminants, to be reported as the recycling rate, which is inaccurate. So, in general, these datasets are likely to overestimate the proportions of material actually recycled, especially in non-deposit territories.

This report looks at units sold, recycled and wasted, not tonnage, but we can approximate this overestimate by looking at a [recently published Ball Packaging report](#) on imminent changes to European reporting of tonnage recycled. This will see the point of measurement moved from the point of collection to the point materials leave a materials recovery facility.

A collection rate of PET at 58% is expected to equal a recycling rate of 42%, while glass is expected to fall from 76% to 66%, This would mean more than a quarter of the weight of PET bales collected for recycling is actually contamination, as is more than an eighth of the glass. Aluminium will be least changed, falling from 74.5% to 69% (unsurprisingly given it is the easiest to reclaim from mixed recycling and the most valuable material by tonne).



Making cans from recycled aluminium uses just 5% as much energy as using virgin materials.

Furthermore, because deposit return systems require producers and importers to account for every container put onto the market, countries with such systems will tend to show higher and more accurate sales figures. Overall, because recycling figures tend to be overestimated and sales figures underestimated, real wastage figures will tend to be higher than the calculations we can make from the available datasets.

In 2019 the overall beverage market in our dataset broke down by container material into 42% PET (41.5% single-use, 0.6% refillable), 25.5% metal, 25.5% glass (17.2% refillable, 7.3% single-use), 6.4% board or carton, and 1.3% HDPE.

In territories where the refillable market had been dismantled prior to 1999, refillable bottles for non-alcoholic carbonated drinks have mainly been replaced by single-use PET bottles, while single-use aluminium cans have largely taken over from refillable beer bottles.

Between 1999 and 2019, the overall market share of single-use PET has increased from 17% to 41%. In some territories this change was even sharper: in the same period in Thailand the market share of this material grew from 7% to 45%, while in India the market share grew from 8% to 48%.

With this increase in beverage production and consumption came a substantial increase in wasted packaging: materials used to make drinks containers that then ended up in landfill, in an incinerator, littered in our urban and rural areas, or breaking down in and polluting our marine environments.

This report looks at that wastage, at the extent to which it has grown, and at the effectiveness of existing systems designed to minimise it, before considering how it can be most effectively tackled.

In addition to the visual impact, and the other obvious problems associated with litter, this wastage also indicates the use of far more carbon-intensive processes and virgin materials than the alternatives, where containers are collected separately after use. Making cans from recycled aluminium uses just [5% as much energy](#) as using virgin materials, for example, while using refillable bottles can [reduce emissions by at least 50%](#).

Littered beverage containers also lead to significant clean-up costs for local government. A [recent report from Changing Markets](#) and Eunomia indicates, for example, that the cost to Spanish local government associated with cleaning up this specific waste segment amounts to up to €529m a year.

All of these are costs essentially externalised onto wider society by the beverage industry. It is cheaper for manufacturers to operate high-wastage models with single-use containers, where permitted by regulation, than it is for them to take full responsibility for their packaging. It is not free to set up systems which collect and separate empty containers by material, whether for refill or for high-quality recycling. The pressures to continue with a high proportion of single-use packaging are compounded by the low price of oil, and by the global shortage of good quality recyclate, given the relatively low number of territories with deposit return, and the low grade materials collected without such systems.

Public awareness of some of these issues has also grown markedly over the last decade, alongside campaign activities by NGOs and other actors. Plastic as a material category has attracted the most interest, with a particular focus on plastics littered in marine environments. This has led to increasing discussion at national and regional levels on what policies should be adopted to reduce litter, improve recycling, and build more circular economies for our resources.

In some packaging or product sectors, solutions to wastage are complex and hard to establish. For drinks containers the answer is more obvious and already proven. In this report, we will consider how a small financial incentive can underpin sophisticated deposit return systems which capture high volumes of single-use containers for recycling, in turn driving a greater use of refillable systems.



Deposit return should be understood in the context of this report to mean the use of small refundable deposits, paid by and repaid to consumers, to drive the collection of single-use drinks containers for recycling.

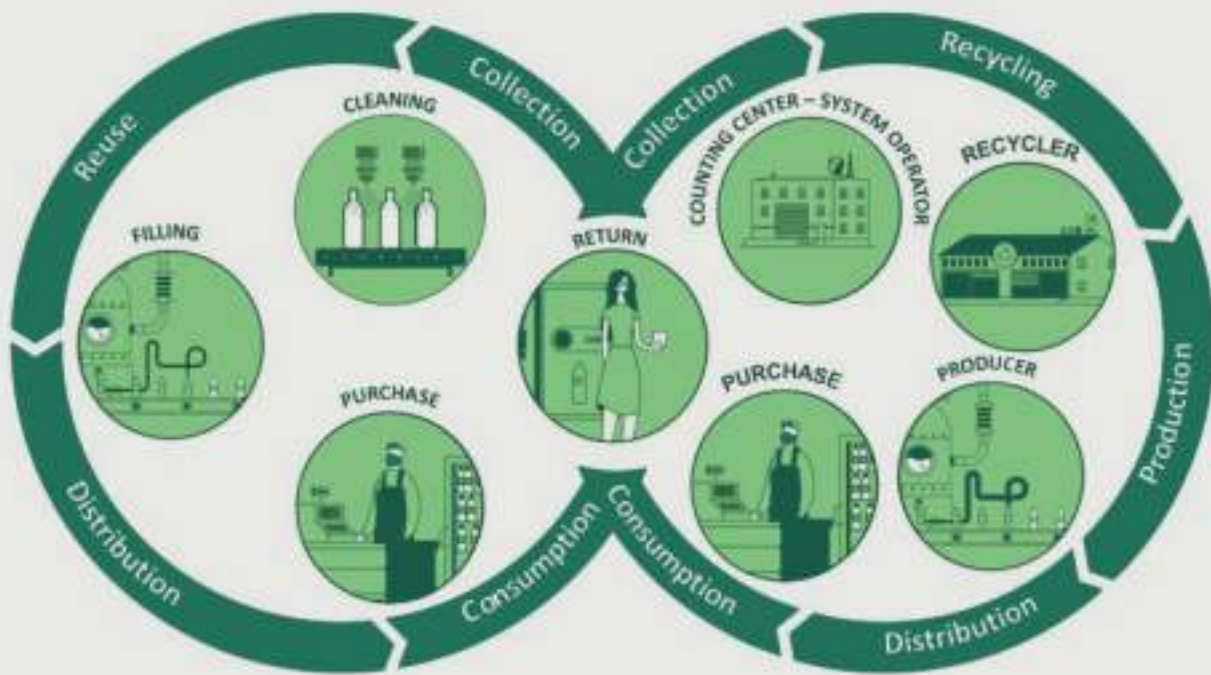
All significant refillable systems also use small refundable deposits, again to drive high return rates. In terms of the containers, the distinction here is what happens after they are returned: is it reuse or is it recycling?

Containers intended to be refilled by the producer are a very familiar system in many territories, and refillable bottles for beer, milk or carbonated beverages are often remembered fondly. Historically refillables were all glass, but PET plastic bottles now make up 3.3% of the global refillable market - they are made to be more robust and thicker than single-use PET bottles, and typically can be reused up to 25 times. Glass refillable bottles are also typically thicker and more durable than their single-use counterparts, enabling the bottles to be re-used, in some cases up to 50 times.

As the dataset shows, the market share for refillables has declined in almost all territories (even if absolute volumes are up in some territories), and ended completely in others.

Modern deposit return systems, however, are on the rise. While deposits have been used to encourage the consumer to return empties for refill for more than 200 years, in the early 1970s deposits began to be charged on single-use drinks containers to encourage their return for recycling and to reduce litter. Many of these systems came about via so-called “bottle bills” in North America, part of the first wave of environmentalism symbolised by the first Earth Day in 1970, the same year British Columbia became the first territory to adopt a deposit system to encourage recycling.

The earliest of this new wave of deposit systems tended to apply small deposits, take limited materials, and rely on a “return to depot” model, where specific return points were built away from the retail locations where the beverage containers were bought. As the concept spread to Europe, especially Scandinavia, systems evolved from the 1980s towards a more inclusive list of beverage packaging materials being accepted, higher deposit levels, and a return to retail model - in other words, you could return your drinks containers within the same environment where you bought them.



These systems typically secure a [return rate of over 85%](#), with Germany showing the best results at 98% returned. And they are spreading rapidly: by the end of 2018, [291 million people](#) lived in countries or territories with deposit return systems, and by the end of 2025 this figure is likely to reach almost half a billion, based on systems committed to but not yet operational.

There are some places where both single-use and refillable containers are used. However, from a consumer perspective in those territories, it does not matter whether the item they return for their deposit is recycled or refilled; that distinction is typically made behind the scenes, very literally, by the handling systems associated with deposit return.

These measures also do not conflict - in fact, the features they share, both behind the scenes and from that consumer perspective, make a strong refillable market a sound basis for introducing deposit return, and vice versa.

This report will therefore look at what the data tells us about how effective these two approaches are, separately and together, primarily through the lens of waste reduction.

The central finding is that, on average, the countries with the least wastage per person collect their beverage containers via a deposit return system, both for single-use and refillable containers. Encouragingly, even when adopted alone, both refillable systems and deposit return still show marked impacts on wastage.

Wider policy recommendations based on the data and on Reloop's related research over the last six years will follow more detailed analysis of the key findings overleaf.

Key findings

Refillable bottles

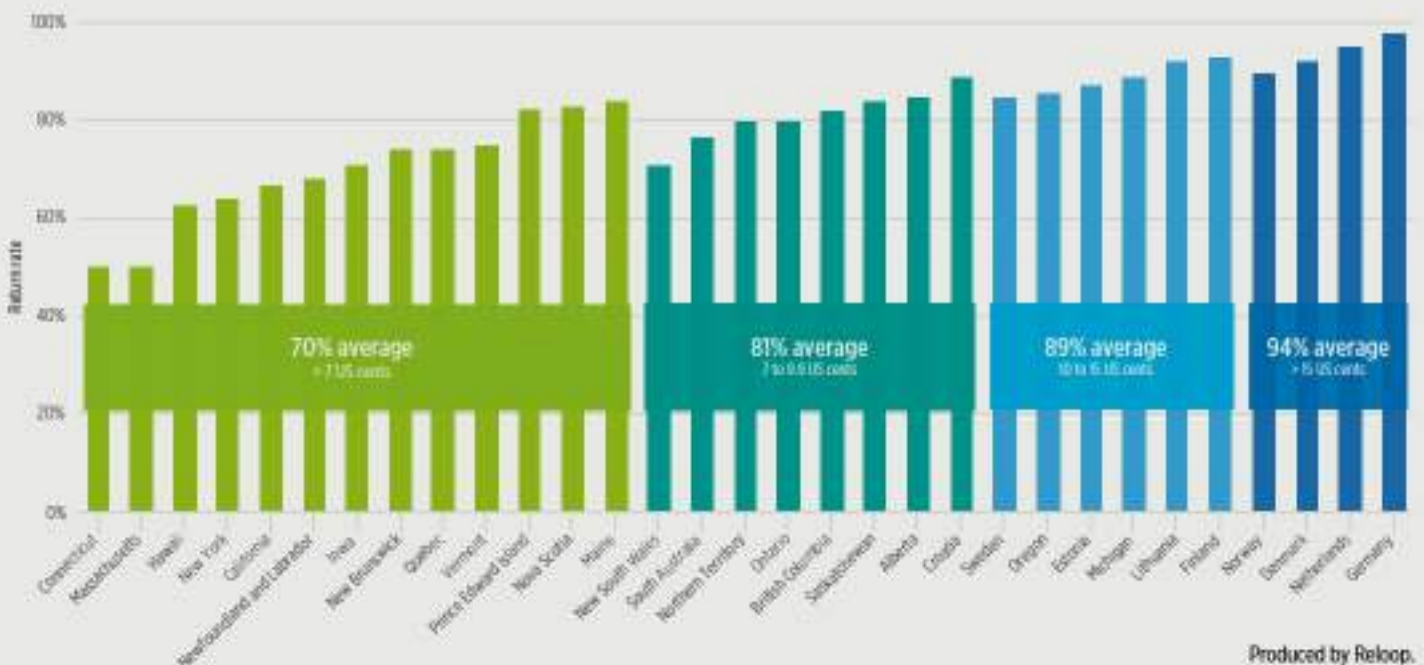
- In 2019, the 10 countries in our dataset with the greatest proportion of refillable sales averaged a 29% market share. In 1999, though, those same countries had on average a refillable market share of double that, at 60%. [\(see figure 2 below\)](#)
- In countries with a refillable market share of 25%+, that share of refillable bottles has fallen from an average of 59% in 1999 to 25% in 2019, with refillable packaging for carbonated drinks most commonly being replaced by single-use PET bottles and refillable beer bottles typically being replaced by metal cans.
- In countries with a refillable market share of 25%+ in 2017, wastage levels were on average 46 per capita, less than half the 95 average across comparable territories with a smaller or absent refillable sector.
- Our dataset shows that if Brazil, with a refillable rate of 24% in 2019, shifted to the refillable rate of neighbouring Colombia, at 54%, Brazil would have seen sales of single-use drinks containers fall from 33.3 billion to 23.2 billion.

Deposit return systems

- At the start of this dataset, in 1999, four European countries, nine US states, eight Canadian provinces/territories, and one Australian state used a deposit return system. By 2020, six more European countries had deposits in operation, five more states in Australia and three additional Canadian provinces/territories had adopted deposits. In the USA, one more state adopted it, while one repealed.
- Those deposit territories achieved an average return rate of containers covered by their systems of 79% in 2018-19, albeit with variation between more modern systems and those established in the 1970s; the latter using deposit levels which are now markedly lower, often because of the effects of four or five decades worth of inflation. To give the example of the US state of Maine, the \$0.05 deposit on beer and soft drinks set in 1978 remains unchanged - if it had kept pace with inflation it would now be just over \$0.20.
- In territories with a deposit return system, wastage levels were on average 78.6% lower in 2017 than comparable territories without deposits.
- In 2015, in Lithuania, prior to the introduction of deposit return, 113 drinks containers were wasted per capita, more than one every three days per person. By 2017, the first full year of the system being in operation, this had fallen sharply to just 14, barely one a month.

Figure 1

Latest return rates in deposit jurisdictions, by minimum deposit level



Overall

- Global sales of single-use drinks containers across the countries in our dataset have increased by 135% over this period, from 456 billion in 1999, up to 1,075 billion (or 170 per capita) by 2019.
- Within that, some drinks categories have seen sharper increases: sales of bottled water have increased globally from 72 billion in 1999 to 309 billion in 2019, going up from 11% to 24% of all beverage sales.
- At the start of the time period being considered, refillables held an average of 33.6% market share across the 82 countries in the 1999 dataset. Eleven of these countries already had a refillable market share below 10% at that point.
- The best-performing countries use both measures, with a 25%+ share of refillables alongside a deposit return system. Looking at Europe, where we have the most comprehensive dataset, the unmoderated markets - i.e. markets without a deposit return system and where refillables have a <25% market share - generate on average almost seven times the wastage level seen in the best-performing group. [\(see figure 7 below\)](#)
- The data also shows that a very high-performing deposit system can deliver very low wastage rates even without a robust refillable market. The second and third best-performing countries after Germany in the European data are Lithuania and Finland, both of which had a refillable market share below 25% for that reference year (Finland at 5% and Lithuania at 14.6%).

Recommendations

The following recommendations are consistent with the data and with Reloop's knowledge of the principles which need to be followed for deposit and refillable systems to be considered best-in-class. Design and implementation of these systems will always need to be guided by the nature of each market and other policy measures already in place.

Given the period over which waste materials persist in our environment and the longer term consequences of continued high levels of demand for virgin materials, adopting either or both of these measures sooner will have marked benefits.

- 1 Reduce wastage by introducing deposit return systems on all single-use beverage containers.
- 2 Require those deposit systems to be inclusive by material and size, centred on return to retail, and as accessible as possible to the public, including people with disabilities, those on low incomes, and customers of delivery services.
- 3 Incentivise beverage producers to switch to refillable beverage bottles where appropriate, by ensuring they can access their containers once collected through wider deposit return systems.
- 4 Consider enacting refill targets or quotas for appropriate types of packaging to incentivise the beverage industry to shift towards better collection models, to allow legislators to assess progress and establish - if the targets have not been achieved - whether additional policy interventions may be required.
- 5 Support beverage container collection systems that allow producers to rent a standard refillable bottle from a third party.
- 6 Set key performance indicators for the refillable sector to maximise environmental benefits, especially minimum number of rotations and minimum collection rates.
- 7 Require all refillable containers to be readily recyclable so that the system follows the waste hierarchy.
- 8 Support the transition away from high-wastage models, including by introducing tax incentives and funding pilots of innovative reusable packaging or recovery methods, in order to shift behaviour within the beverage supply chain.
- 9 Where both measures are in operation (or planned), ensure their clear interoperability from the consumer perspective so that the highest rate of return is achieved.

Refillables

As discussed above, refillables have a centuries-long history, but in the second half of the 20th century the environmental strengths of this approach were less widely recognised. In many markets they were superseded by what was widely perceived at the time as more efficient systems, despite the clear reduction in virgin material demand associated with refillable containers, and, relatedly, the lower carbon impacts. These issues are considered in more detail in a co-authored report by [Reloop here](#).

Given that a shift to single-use cans and bottles allows manufacturers to externalise their waste costs, and in the context of a lack of regulation to protect refillable markets in almost all territories, the market share held by refillables has been under considerable pressure over our time period, and indeed before. In many G12 countries, including the USA, France, Japan and the UK, refillables represented less than 10% of units sold by 1999, the point at which our first datasets begin. Some smaller producers of milk, beer or soft drinks still ran their own refillable systems in these countries, but for a negligible aggregate market share.

Elements of our dataset go back to 1999, and in 40 of the 82 countries represented in the data, including mainland China, Nigeria, Thailand and Vietnam, refillable bottles were still used for the majority of drinks. By 2019, in a slightly larger dataset of 93 countries, just four of them saw a majority of drinks sold in refillable bottles - Columbia, the Philippines, Venezuela, and Germany.

Across those 82 countries with a complete dataset from 1999 to 2019, only four showed an increase in market share held by refillables. In each case it is clearly associated with a change in one or other specific beverage sector.



Unlike deposit return, the use of refillable systems is now most widespread outside Europe.

Morocco saw just 2% of carbonates (fizzy soft drinks) sold in refillable glass in 2009, but by the very next year this was up to 22%, and by 2019 29% of carbonates were sold in refillable glass after a 2016 peak. The carbonates market in Bosnia & Herzegovina also led a small overall increase over this period, with that segment going from a 20% refillable share in 1999 to 33% in 2019. Costa Rica similarly saw a 45% increase in refillable market share for beer over this period, which contributed to a small overall increase. Saudi Arabia saw a tiny overall increase, driven again by carbonates: the market there remains overwhelmingly supplied via single-use containers. The explanations for these instances of increased national refillable market share are not immediately obvious, and further investigation could prove fruitful.

Unlike deposit return, the use of refillable systems is now most widespread outside Europe. Germany is the only European country amongst the top 10 countries for refillable use, by absolute unit volume, with mainland China, Mexico, India and the Philippines making up the rest of the top five.

In most of that top 10, absolute volumes of refillable units sold have risen over that 20 year period, and, looking across the whole of this dataset, we see a marginal aggregate increase in refillable units sold, from 230m in 1999 to 233m in 2019. However, in all these countries, in the context of substantially increased sales of drinks in single-use containers, refillables now claim a smaller market share, down by between 16% and 52%.

Brazil illustrates this trend neatly, as the table below shows. While the overall volume of refillables increased marginally between 1999 and 2011, as a share of a growing market refillables fell from 40% to 24%.

Across those same 10 countries, the table shows that single-use PET containers outsold refillables for the first time, on average, almost 10 years ago. The increase in sales of other single-use packaging, especially cans, further eroded the refillable market share. Overall, looking at the most recent four years of data, the market share for refillables across the whole dataset is falling at just over 0.5% per year.

Figure 2

Top 10 countries by sales, with market shares for 1999 and 2019, and change in market share over that period

Country	Market share refillable 1999	Market share refillable 2019	Change 1999-2019
Mainland China	52%	22%	-30%
Germany	73%	54%	-19%
Mexico	53%	27%	-26%
India	87%	34%	-52%
Philippines	86%	59%	-27%
Brazil	40%	24%	-16%
Colombia	91%	54%	-37%
Nigeria	87%	43%	-44%
Vietnam	52%	31%	-21%
Thailand	51%	20%	-31%
Total Top 10	60%	29%	-31%

By comparison, the global data, dominated by markets like the US where refillables held negligible market share throughout this time period, shows metal cans increasing less steeply from a higher base, but second only to single-use PET bottles by the end of the time period considered.

In many of those markets the transition of beer in particular from refillable glass to single-use aluminium cans had taken place prior to 1999. The charts below, again, show the rapid shift to single-use PET dominance taking place over this period.

Figure 3

All beverage sales, 1999 – 2019, by material: top 10 countries, total refillable sales 2019

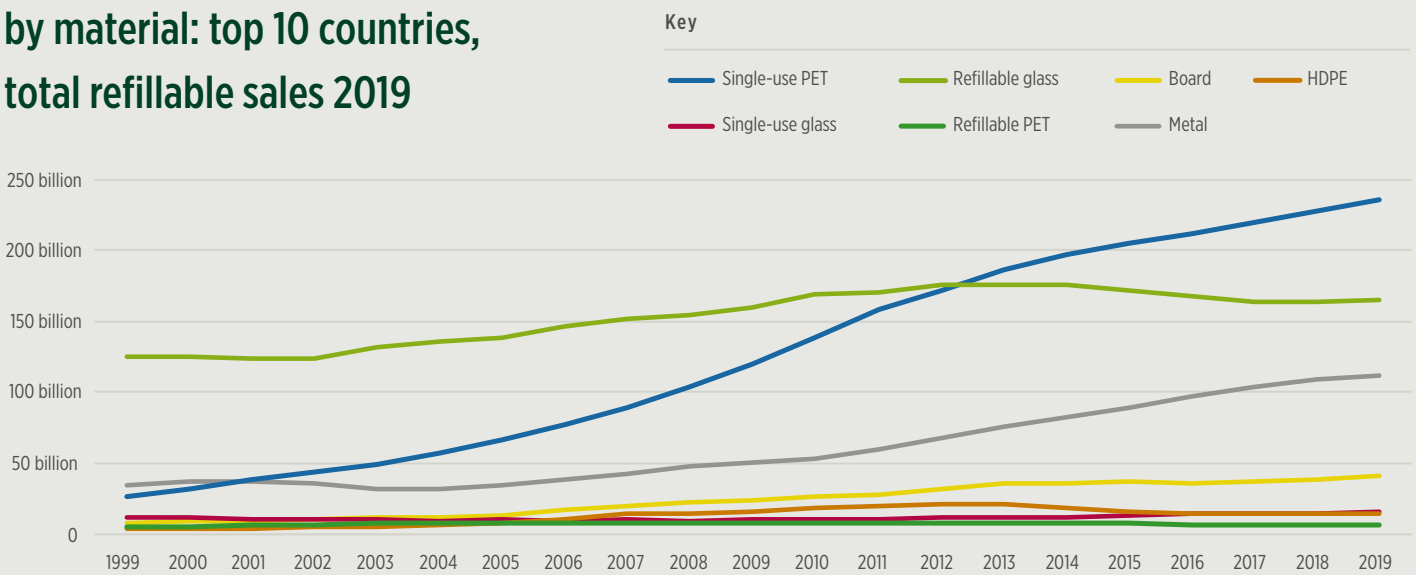


Figure 4

All beverage sales, 1999 –2019, by material: all 93 countries studied

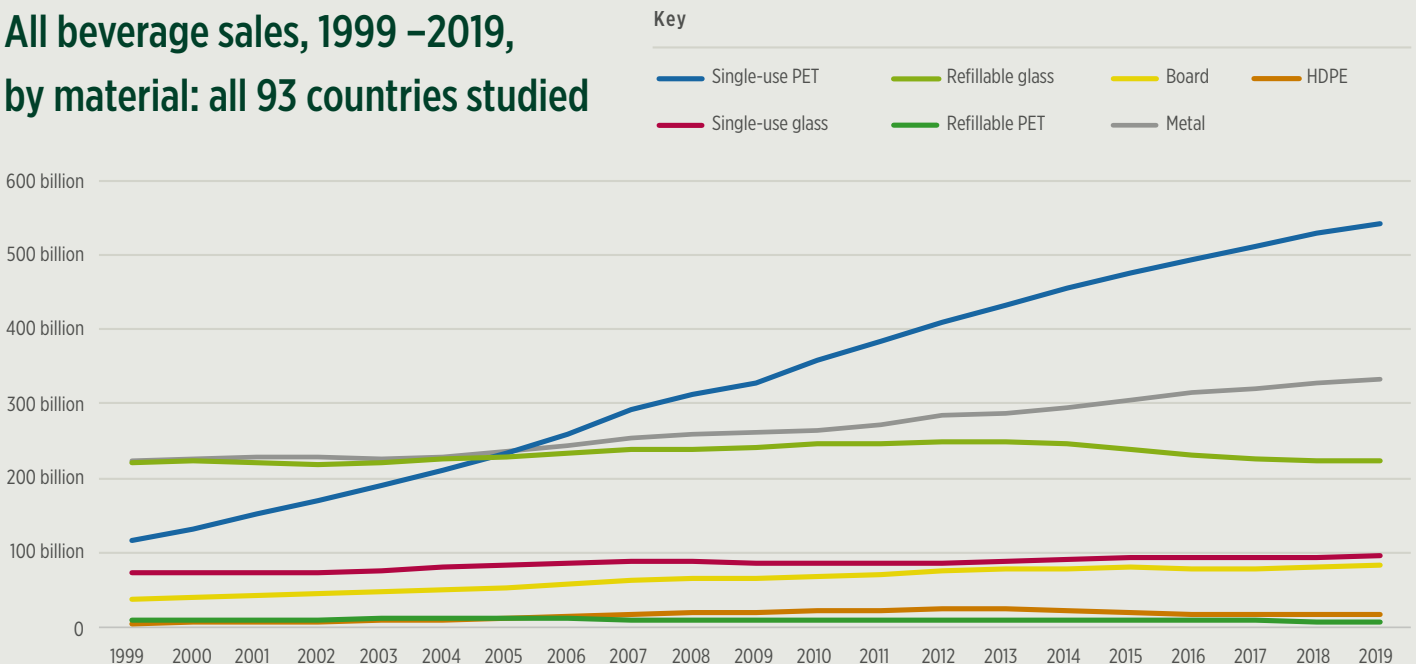


Figure 3 and 4 produced by Reloop using data and insights from GlobalData PLC.

The example of Mexico is also very telling. In 1999, 55% of carbonates were sold in refillables. In 2000 Vicente Fox, the former Chief Executive of Coca-Cola Mexico, was elected President, and served until 2006. By 2009, the refillable share of that beverage segment was down sharply to 31%, although it stabilised over the next decade to 2019, only falling another 3% points to 28%.

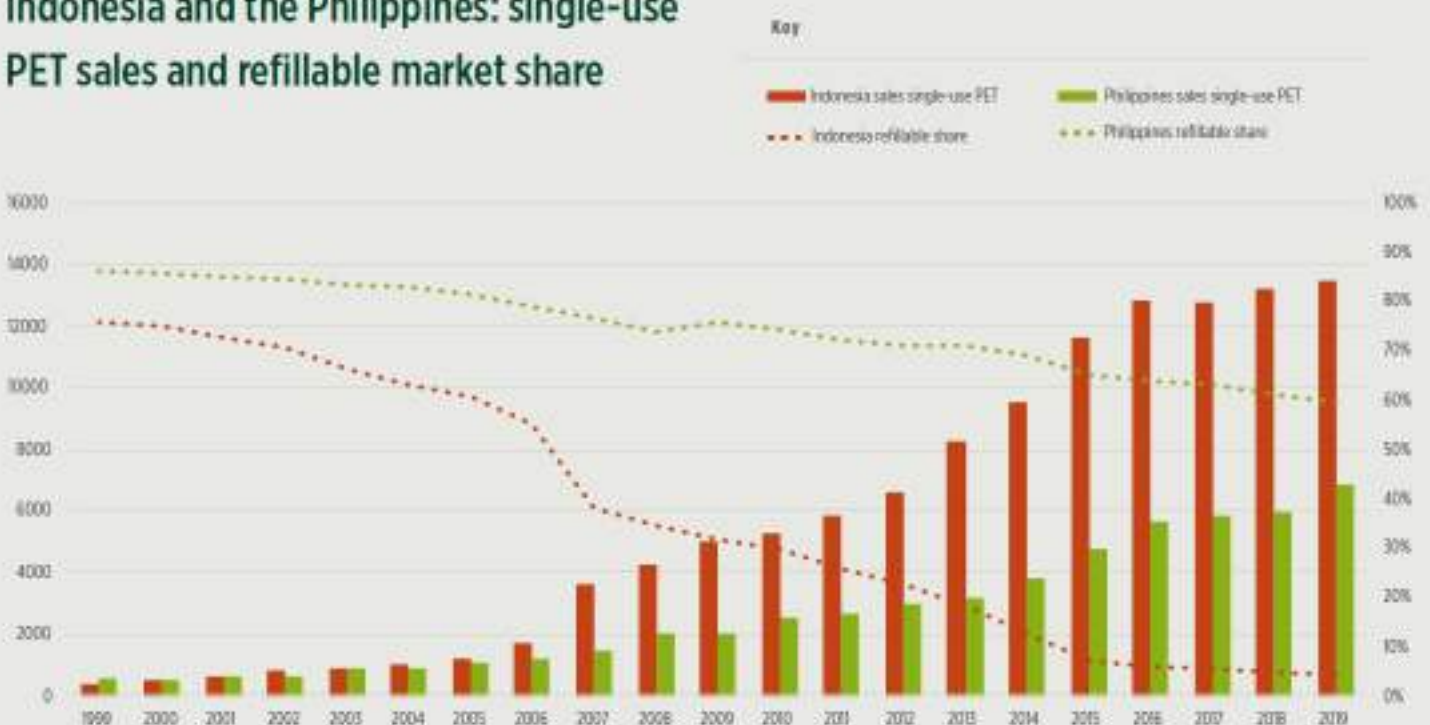
Comparing the Philippines to Indonesia illustrates how a relatively resilient refillable market share can affect the change in the volume of single-use PET bottles sold (and hence wastage) - especially when compared to Indonesia, where the refillable sector has almost disappeared.

In 2019 refillables retained 59% of the overall market in the Philippines, the highest level seen in Asia, albeit down from 86% in 1999. Over that period, the sale of single-use PET bottles did increase substantially - from over 500m in 1999 to nearly 7,000m in 2019: i.e. more than 13 times as many were sold during the last year for which we have data.

However, in Indonesia, where the refillable market share has fallen from 76% in 1999 to just over 4% in 2019, we see sales of single-use PET bottles increase from 374m in 1999 to 13,481m by 2019. This is an almost 36-fold increase, much sharper even than that seen in the Philippines.

Figure 5

Indonesia and the Philippines: single-use PET sales and refillable market share



However, this absolute disparity is not seen in wastage per capita figures, given that Indonesia has a much higher population than the Philippines (267m vs 106m). GA Circular, commissioned by Coca-Cola, published [data in 2019](#) which showed the recycling rates for PET only in six Asian countries: Indonesia, the Philippines, Vietnam, Thailand, Myanmar, and Malaysia. Using those numbers, while noting the producer interest in that research, we can estimate per capita wastage figures for PET only in five of those six countries (the GlobalData dataset does not cover Myanmar).

The data shows Indonesia is actually the lowest, given markedly lower overall levels of consumption, with 38 PET bottles wasted per person per year, while Malaysia and Vietnam are both at 43, and Philippines just above that at 44. The outlier from this group is Thailand, at 117. This is a result of markedly higher sales of drinks in PET containers in Thailand - more than three and half times as many are sold per capita as Indonesia, which has the lowest sales in this group.

Despite the widespread decline in refillable market share, there are areas where this may change, typically led by industry rather than by the kind of governmental measures discussed in the recommendations. For example, [Coca-Cola in Brazil](#) has been moving to reintroduce refillable PET bottles for carbonated beverages, and the company is aiming for 40% of their drinks in that category to be sold in this format in future. If the whole carbonates sector in Brazil had achieved that refillable market share in 2019 the number of single-use containers sold in the country would be reduced by more than 2 billion. We note here that, in the absence of good data for the current recycling rates, the current wastage level for Brazil cannot be estimated.

In order to maximise the ecological and economic benefits associated with refillables, there are a range of modest policy requirements which have proved effective when seeking to reduce wastage.

First, the benefits of refillables are correlated with the high collection rates associated with the refundable deposit, and with high rotations (ideally, as close as possible to their maximum lifespan, of course). These are sensible performance indicators for policy-makers to prioritise where the sector is subject to regulation.

Similarly, no refillable containers can be reused forever, so it is important also to require all refillable containers to be made from readily recyclable materials. This reduces the risk of wastage at their end of life.

Relatedly, appropriate market segments could be subject to refill targets or quotas. The aim here is to establish whether other regulations and support are providing a sufficient steer to the market, and to help close off opportunities for some producers to continue to externalise a higher proportion of their costs back onto the public sector.

Per-manufacturer refillable containers (typically used for brand recognition purposes, mainly through the use of particular shapes) also increase aggregate market costs. Policy-makers should consider supporting systems where producers can rent a standard refillable bottle (or one from a range of standard bottles). The providers of such bottles may also be the best bodies to wash and sterilise bottles for reuse.

While measures of this sort can help protect or build a refillable sector in partnership with producers, those territories which have retained relatively stronger refillable sectors have largely done so as a result of cultural factors, including strong traditions of refillable use in particular segments (like beer, in some countries) and also wider attitudes to waste and circularity.

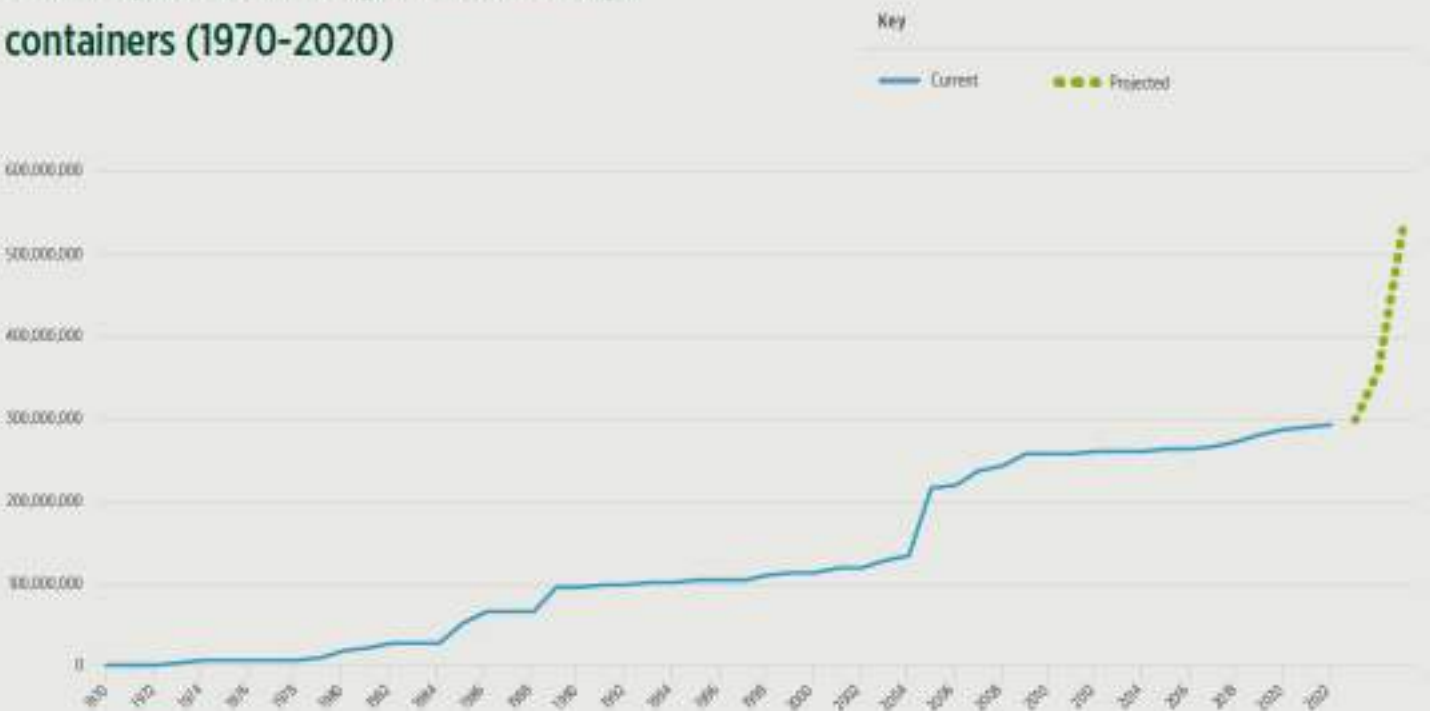
Deposit return

Deposit return systems charge the consumer a small deposit on drinks containers, a sum which is refunded in full when they return the empty container, either over the counter or through a reverse vending machine. These systems began to spread in the early 1970s, and can now be roughly divided into those early return-to-depot systems, which encompass most of the US states with deposits, and modern return-to-retail systems, predominant (although diverse in detailed implementation) in Europe, especially Scandinavia and the Baltic countries.

Deposit return is spreading rapidly as an effective model for states and territories to use to reduce wastage costs. By the end of 2020, 291 million people lived in countries or territories which used deposits, a figure expected to reach almost 500 million by the end of 2023. The overwhelming bulk of those systems are of the modern type, with all capturing PET bottles and metal cans, many also covering single-use glass, and some even including board and other materials.

Figure 6

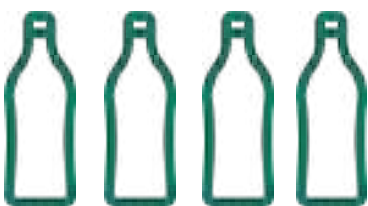
Global population with access to deposit return systems for single-use beverage containers (1970-2020)



Within Europe, this trend is likely to accelerate soon: Romania and Turkey have start dates set in law, as does Scotland. EU member states without a deposit system are likely to adopt one to meet the terms of the [Single Use Plastics Directive](#), which sets a 77% separate collection target for plastic bottles by 2025, going up to 90% by 2029, a target which is not met anywhere without the use of deposit return.

Policy-makers are increasingly looking to embed circular resource management practices to achieve a range of objectives, both economic - as the process of implementing and running a national deposit system is shown to create a significant net gain in new jobs - and environmental, including improving communities by reducing litter. To give one example of the potential for litter reduction, Eunomia conducted research on the effect a deposit return system will have in Scotland on littering rates. Despite a population of just 5.5m, they estimate that each day [140,000 bottles and cans](#) are littered in Scotland that would have been collected via deposit return. The Scottish Government similarly estimate the daily carbon savings associated with deposit return at [131 tonnes](#), and the daily savings for local government if deposit return were introduced at just over £0.5m across Scotland ([see par 65 here](#)).

Comparing all deposit territories to all non-deposit territories (irrespective of refillable share), we see a marked difference in wastage per capita. In deposit territories this rate averages to 24 containers wasted per year, but is more than four and half times higher in non-deposit territories at 112 containers per year.



The typical country-wide deposit return system sees median return rates of 91% for PET, 89% for cans, and 87% for glass. This allows us to see what the impact would be of adopting a system of that sort. For example, if Greece introduces a deposit system that achieves those return rates, it would reduce its annual wastage of PET bottles from 1.5 billion to just 207 million, reduce can wastage by 233 million, and glass wastage by 122 million.

Recycling rates for countries in the global south are much harder to obtain. In 2014 mainland China's overall plastics recycling rate was reported at [22.8%](#): it is of course much more speculative, but we can calculate wastage as if that rate was accurate for PET drinks containers. If that were the rate, more than 90bn PET bottles would have been wasted. Adopting a typical deposit return system would have seen wastage fall that year to just over 10bn.

The example of the United States is particularly stark. Their overall drinks container sales per capita is the highest in this dataset, almost 15% higher per capita than Belgium in second place. Of the 50 states, 10 have deposit return systems of one sort or another, with Oregon's and Michigan's systems being the best performing, delivering return rates comparable to the modern European systems. Oregon was the first state to pass a "bottle bill" in 1972, and modernised its system at the start of 2018. It now operates in a similar way to those European deposit systems, although does not pay the retailer handling fee typical across Europe (with handling fees being one of the principles Reloop believes to be a key factor of a best-in-class system). Michigan achieves a 90% return rate, while the Oregon Beverage Recycling Cooperative, which handles the bulk of containers in Oregon, saw a rate of [90.8% in 2019](#), similar to the median national deposit system discussed above.

Using recycling data from US sources per material ([NAPCOR for PET](#), the [Aluminum Association](#), and the [Environmental Protection Agency](#) (EPA) for glass), we can estimate the overall reduction in wastage if the whole of the United States adopted a system with a 90% return rate, i.e. as efficient as those two state systems. In 2017, 137 billion drinks containers were wasted nationally: this would fall to just over 20 billion with deposit return.

As discussed above, the effectiveness of refillable systems at reducing overall wastage is primarily a function of three variables: deposit level, market share, and return rates (i.e. how often a container is collected and refilled).

The equivalent to market share for a deposit return system, though, is scope: what materials and/or drinks are mandated to be sold with a refundable deposit? Those systems which are limited to metal cans and PET bottles will inevitably do nothing to reduce wastage of glass bottles, cartons, or other materials.

Furthermore, a broad scope is important to reduce the risk that manufacturers switch materials to avoid deposits, although there are technological or market restrictions on this - for example, carbonated materials cannot be sold in cartons, and there may be consumer resistance to packaging change for particular drinks or segments.

Return rates, of course, matter exactly as much for deposit systems for single-use containers as it does for refillables. The most obvious variable here, as with refillables, is the use of an appropriate deposit level - high enough to motivate consumers to return containers but not so high that they distort the market.

However, ease of container return is just as important, which points toward a return-to-retail model rather than return-to-depot. This would typically require limited exemptions for small retailers and options for voluntary return points, as well as systems for return via delivery systems, which are showing a steady increase in popularity with consumers.

Other elements of best practice for deposit return - such as how a system should be run, what handling fees should be paid to retailers, etc - are covered in [analysis for Reloop here](#).

Conclusion

How these measures work together to reduce wastage

Europe, especially northern and western Europe, give us a unique opportunity to consider how this pair of measures affect wastage levels in comparable territories, separately and together.

Modern deposit return systems are concentrated in these markets, and there are a moderate number of countries with a relatively strong refillable market share here too. We also have better data for this region, with sales and recycling numbers available, both broken down by material, for 27 countries, albeit only for 2017.

This richest part of the dataset allows us to make clear comparisons between four approaches, where “uses refillables” is defined as having a refillable market share of 25% or more across drinks categories:

“unmoderated markets”

Territories without deposit return and with a refillable market share below 25%, instead relying on kerbside or other communal recycling facilities, shown in ■ purple below.

“refill and deposits”

Territories with a refillable market share at 25% or above and a deposit return system, shown in ■ green below.

“refillable only”

Those territories with a refillable market share at 25% or above but without deposits for single-use containers, shown in ■ orange below.

“deposits only”

Those that use deposits for single-use containers but have a refillable market share below 25%, shown in ■ blue below.

The chart below shows how those 27 European countries, once divided into those four categories, score in terms of wastage of containers.

Figure 7

Single-use beverage containers wasted per capita, by country, 2017



It should be noted that the deposit return system operational in the Netherlands does not yet include cans or PET bottles below 1l in size, although that will change in July 2021 as smaller PET bottles for water and carbonates are brought into scope (cans for water, carbonates and beer will also be included from the end of December 2022). We have used the PET return rate for those larger bottles already in scope to generate this wastage figure, so the actual wastage figures for the Netherlands will be substantially higher than shown here (although it is likely to be a close approximation to their figures once the inclusion of smaller PET bottles has bedded in).

Even 24 per capita per year, though, already makes the Netherlands the worst-performing country in that top category, i.e. countries with a 25% refillable share and a deposit return system. This factor also means the Netherlands data cannot accurately be shown in the PET-specific chart below.

The dataset we are using here does not always align with in-country data: for example, in Norway their deposit system operator records a markedly higher volume of beverage sales overall. The only place this makes a marked difference to the chart above is with Austria, where the data shows a refillable share of 29%, but Austrian government data shows it at just 21%. This would move them into the "unmoderated markets" section, where they would be the third best-performing country. This chart uses the GlobalData dataset throughout for methodological consistency.

The per capita American wastage figure is more than twice that of any other national number calculated by Reloop.

With that caveat in mind, the gap between the best- and worst-performing systems in this dataset is not small - Hungary and Greece both see more than 18 times more drinks containers wasted per capita per year than best-placed Germany. Looked at another way, Germany is the only country where the average monthly drinks container wastage per person is below one, whereas in Hungary one container is wasted per person every 48 hours.

The only two other countries we have data for here are the USA and Canada. Canada would appear above Poland and below Spain, with 139 containers wasted per capita per year. The American figures are, as far as this dataset goes, in a class of their own, with 422 wasted containers per capita per year, slightly over half of which are PET bottles.

This per capita American wastage figure is more than twice that of any other national number calculated by Reloop. As discussed earlier, all such wastage figures can be assumed to be an underestimate due to certain known limitations in the data. This general disparity can be illustrated using the US data in two ways.

First, we have used the EPA's 2017 glass recycling rate of 38.9%, but information from the Container Recycling Institute (CRI) indicates that the EPA substantially underestimates glass containers put onto the US market, and that a rate of 27% is more likely to be accurate. If we applied a 27% glass recycling rate it would increase the 2017 wastage number from 422 to 435 per capita.

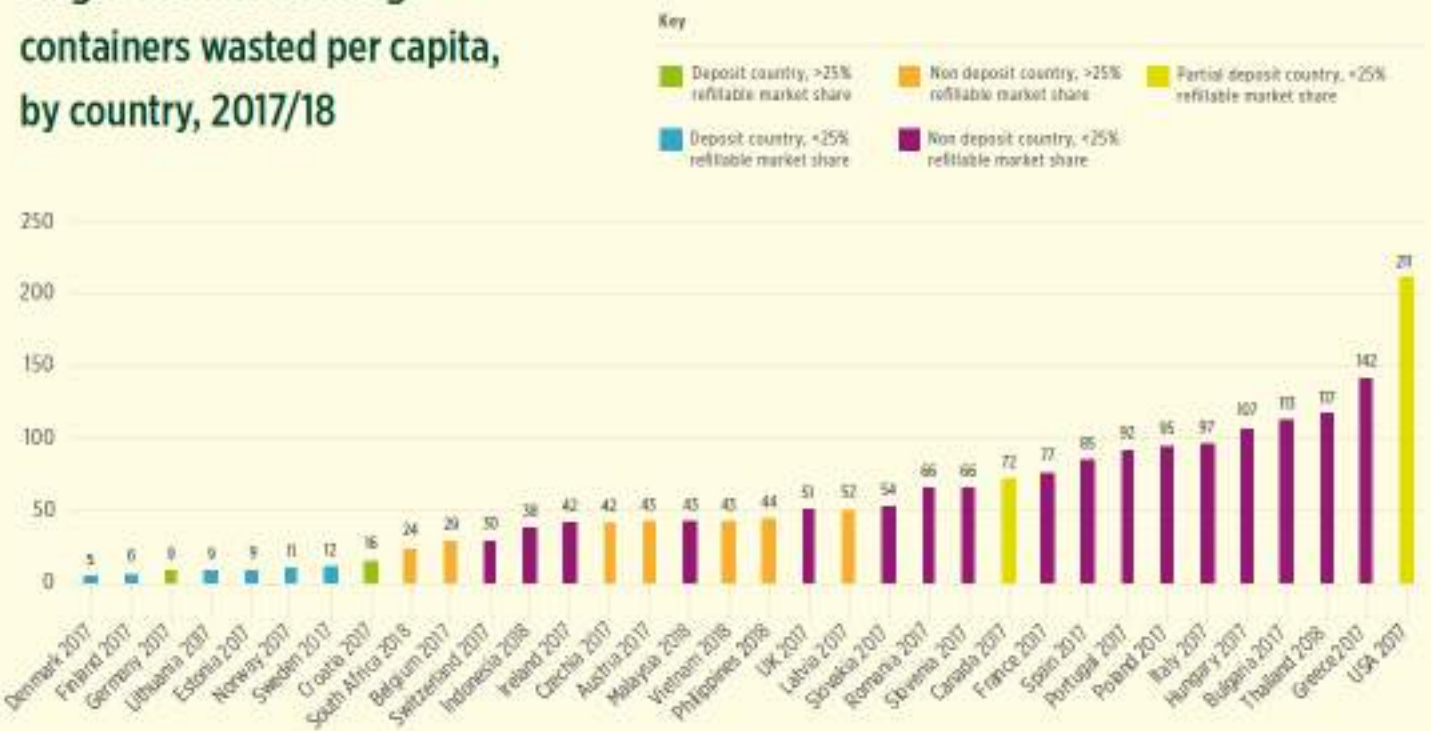
Second, and more significant, the GlobalData sales figures do not cover wines and spirits, overwhelmingly sold in glass in the US, nor milk, nor do they cover pouches and board, predominantly used for non-alcoholic drinks. Again using estimates from CRI, the overall wastage figure with those beverage and packaging types added in is expected to be closer to 600 than to 500, per capita, markedly above the figures produced by our model. This illustrates how important it is for policy-makers to have access to accurate, comprehensive and transparent in-country data on both sales and recycling rates.

As the chart clearly shows, the combination of both measures is, on average, the best way to reduce wastage, although the best-performing deposit-only systems, typically inclusive in terms of materials scope, are competitive here. Although "refillable only" countries score less highly than "deposit only" ones, they still show a reduction in wastage, on average, of almost 46% compared to the unmoderated markets which include some of the continent's most populous countries.

Finally, the GA Circular dataset discussed above allows us to show levels of PET-only wastage across a range of countries where we cannot always generate wastage of other materials, and again the correlation between deposit return and lower wastage levels is clear.

Figure 8

Single-use PET beverage containers wasted per capita, by country, 2017/18



Whether any individual unmoderated market should adopt a refillable or deposit return system as a next step to reduce their own wastage levels will depend on their economic and political context, and perhaps also historical experience. However, the litter reduction and improved resource management effects they share, and their common financial incentive for the consumer, plus their requirement for packaging waste collection infrastructure, means that either or both would be a positive step.

In reality, a deposit system for single-use containers creates supporting system conditions for a refillable system, and vice versa, both in terms of the collection infrastructure and consumer engagement.

In a European context, the most effective way to minimise wastage remains both measures and, in Reloop's view, that approach is the ideal more widely, subject to local conditions.

The relationship between refillable market share and the presence of a deposit return system is complex and varies widely according to the specifics of regulation, business decisions and consumer culture.

Finland, for example, had a refillable market share of 80% in 1999, three years after their deposit return system launched. This share had dropped to 4.3% by 2019, with the change predominantly driven by a cut in taxes on single-use containers introduced in 2004.

In Lithuania, however, refillable market share has actually grown slightly since their deposit system launched in 2016, from 16.3% in 2015 to 17.2% by 2019, mostly in the beer category. The chair of USAD, the deposit return system administrator, has [set out in detail](#) how the interoperable design of these two systems has worked both for consumers and to protect refillable glass market share.

In Germany, the refillable market share has fallen since the 2003 introduction of deposit return, but the story is not as it is sometimes represented. Refillable market share was falling continent-wide as producers took the opportunity to reduce the costs to them, but as [has been noted](#): *“the decline in the use of refillables was less pronounced in Germany, from a market share of 71.1% in 2000 to 54.9% in 2017, and the introduction of the one-way DRS [deposit return system] can be considered a significant causative factor”*.

To put this discussion into a broader context, mechanisms which allow producers to recover their containers, either for refill or recycling, should be understood as part of the broader extended producer responsibility agenda. The costs of running these systems fall on producers, and typically they are also in a position to ensure they run as efficiently as possible, i.e. they are not permitted to externalise their costs associated with packaging, but they are permitted to minimise those costs where not at the expense of the societies they operate in.

In Lithuania refillable market share has grown slightly since their deposit system launched in 2016.

The consumer may not have considered whether a particular bottle they return through a reverse vending machine is destined for refill or recycling - that sorting takes place behind the scenes. They merely know it is not being wasted.

At first glance, approaches which both charge the consumer a deposit might look like “consumer responsibility” schemes. However, with both refillables and deposit return, the net costs of running the system are borne by industry - excluding the unredeemed deposits, which reduce those costs - and the consumer gets their money back in full when they return their empties.

This model may also be applicable to other markets, beyond the scope of this report, most obviously starting with the adjacent market for single-use cups for hot drinks, where again deposits and uniform returnable cups are starting to be implemented in some local areas.

In general, the experience of the post-war expansion in single-use products and packaging shows that the principle of extended producer responsibility, with 100% net cost recovery, is the most significant policy lever in terms of reducing waste, unlike consumer education or other non-regulatory measures.

The economic incentive of small refundable deposits, either to recover refillable bottles or a broader spectrum of single-use materials for recycling, simply works. But, even better, in those territories where both are in operation and working well, such as Germany, the experience for the consumer is typically seamless, with the ultimate outcome being a return rate of all containers of up to 98%. In some cases they will be returning refillable bottles to retail outlets which specialise in those markets, or it will be obvious that a metal can will be recycled once returned. In other cases, though, as the Lithuanian example above shows, they may not even have considered whether a particular bottle they return through a reverse vending machine is destined for refill or recycling - that sorting takes place behind the scenes. They merely know it is not being wasted.





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Image credit: Green bottle Image on cover by Nick Harris



**Deposit Return Scheme
Consultation Response on legislative framework and scope of the
scheme**



Date: 07. May 2021

Respondent Name: TOMRA SYSTEMS ASA

TOMRA applauds and fully supports the Irish Government's intention to and rational behind implementing a DRS for single-used beverage containers, with a specific focus on PET bottles and metal cans (steel/aluminum).

Table of Contents:

1. About TOMRA
2. DRS in the framework of the Circular Economy
3. How does a DRS operate?
4. The preferred model for a DRS in Ireland
5. Details of the scheme to be set out in Regulation
6. Appendix

1. About TOMRA

TOMRA was founded on an innovation in 1972 that began with the design, manufacturing and sale of reverse vending machines (RVMs) for automated collection of used beverage containers. Today TOMRA provides technology-led solutions that enable the circular economy with advanced collection and sorting systems that optimise resource recovery and minimise waste in the food, recycling, and mining industries.

With an installed base of approximately 83,000 systems in over 60 markets, TOMRA Reverse Vending is the world's leading provider of reverse vending solutions. Every year TOMRA facilitates the collection of more than 40 billion empty cans and bottles and provides retailers and other customers with an effective and efficient way of collecting, sorting and processing these containers.

In addition, TOMRA creates sensor-based technologies for sorting and process analysis within the recycling, mining, food and other industries. With more than 13,740 installations worldwide, TOMRA Sorting Solutions offers a unique range of complementary sorting technologies, the most extensive service base, and the widest geographic and market segment coverage in the industry. Subsequently, TOMRA is a global leader in its field and has pioneered the automation of waste sorting. Its flexible sorting systems perform an extensive range of sorting tasks and are able to both prepare and sort various types of metals and waste for either material recycling or energy recovery. Currently TOMRA Sorting Recycling has an installed base of close to 5,960 units across more than 40 markets.

The information contained in this consultation response represents TOMRA Systems ASA's extensive experience, opinion, approach and attitude towards the establishment of a modern, cost efficient Deposit Return System (DRS) for single-use beverage containers.

2. DRS in the framework of a Circular Economy:

Within the framework of the Circular Economy, a Deposit Return System (DRS) is the most suited and efficient economic instrument when aiming to achieve full circularity for beverage containers. Besides being the only solution able to fulfil the Extended Producer Responsibility (EPR) obligations for close to 100% of the products sold to the market, it is also the best application of the polluter pays principal.

A well designed, modern, efficient DRS is thereby able to:

1. Achieve high collection and recycling rates above 90%¹

¹ European collection rate average for PET/Glass bottles and metal containers in the 10 existing European DRS is > 90%

2. Guarantee a stable feedstock and supply of high quality secondary raw materials for the domestic processing and recycling industry, which can subsequently be integrated into new products (bottle-to-bottle)
3. Achieve an instant reduction of terrestrial and marine litter, particularly for those beverage containers consumed on-the-go

The overall aim of any DRS should be:

1. Maximising the quantity and quality of the targeted materials when it comes to collection, sorting and high-quality recycling
2. Preventing terrestrial and marine litter
3. Easy access for the consumer
4. Running at the lowest possible cost for all stakeholders involved thereby achieving maximum economic and environmental benefits
5. Fulfilling the Extended Producer Responsibility (EPR) obligation

However, no two existing deposit systems are identical - local culture, industry structure and political objectives form the system. The system needs to be adapted to the existing environment in which it shall operate. TOMRA has built on more than 48 years of experience in the field of DRS (single use/refillable) concluding 12 key elements, which are recommended to be included in a modern cost-efficient DRS, to achieve the above desired key results:



A full copy of the TOMRA White Paper “Rewarding Recycling: Learning from the world’s highest-performing deposit return systems” will be attached as an appendix to the consultation response.

3. How does a DRS operate?

DRS is the only scheme reaching today's and future high quality and quantity collection, sorting and particularly recycling requirements for single used beverage containers.

Looking at the 10 existing DRSs within Europe the lowest performing system, Iceland, currently (2019) has a collection rate of 87% for all beverage containers (plastic/metal/glass) included, whereas the highest performing system, Germany, currently has a collection rate of 98% for all beverage containers

(plastic/metal/glass) included. Furthermore, when taking into account the collection rates of all 10 existing systems within Europe, the median value amounts to > 90%.

The Lithuanian DRS started operating in 2016. In 2015 the combined collection rate for the targeted beverage container materials (plastic/metal/glass) was 32%. One year after the system was in place the collection rate increased to 74% following a further increase to 92% at the end of 2017. (Source: USAD (Scheme Operator Lithuania) – see appendix))

It is important to note that within a DRS the collection rate pretty much equals the recycling rate of the targeted materials, due to the lack of impurities and contaminants during the collection and sorting process. In order to reach maximum efficiency related to recycling, a DRS shall ideally include easy to recycle materials.

Source: USAD (Scheme Operator Lithuania) – see first consultation response on Potential Models for Ireland)

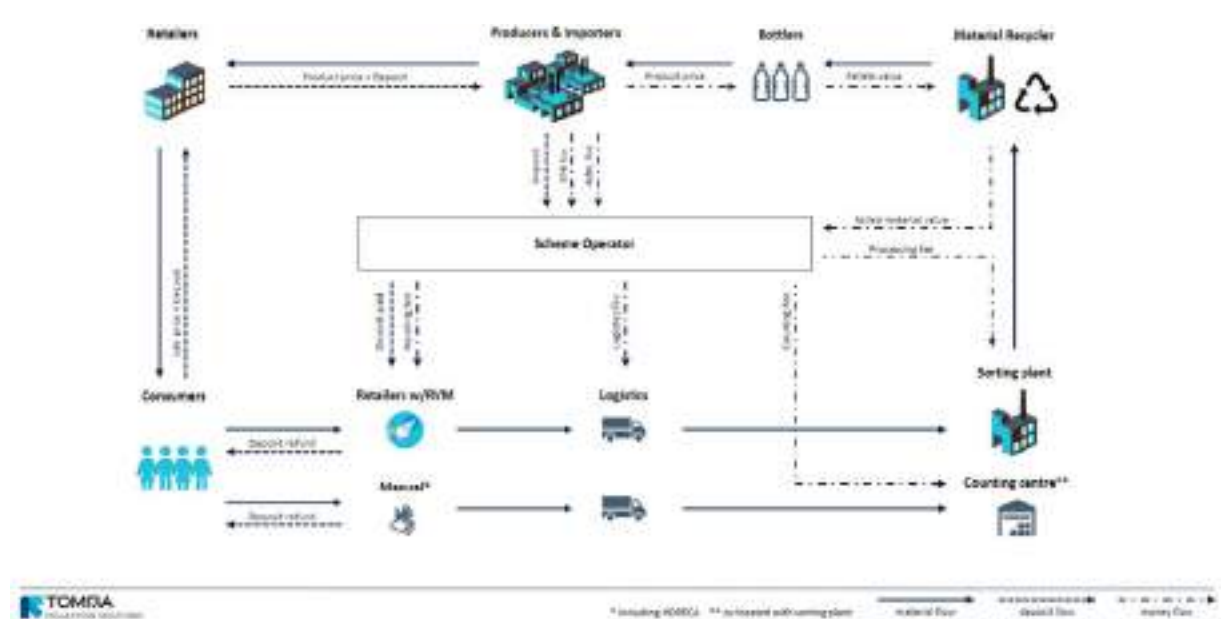
Increasing the collection rate of targeted materials within a DRS will automatically lead to a reduction in beverage container litter. Research from US for instance has also shown that not only beverage container litter is reduced, but also overall litter.

Many one-way deposit systems worldwide were approved and implemented with the clear objective of reducing litter (e.g.. Sweden, British Columbia, California, Michigan, Hawaii) and have proven successful.

Source: See first consultation response on Potential Models for Ireland)

The system works as follows:

TOMRA fully supports the proposed DRS design in Ireland, as its logic follows the best practice examples seen in Europe. Almost identical approaches are taken in Scotland (start date: 01.07.2022) and Latvia (start date: 01.02.2022)



- Beverage producers initiate the deposit by paying it into a deposit account;

With regards to the deposit, it is important to note that from the moment the beverage container is placed onto the market the deposit shall be charged by each additional distributor at each distribution level until transferred to the final consumer.

It is important to note that retailers today are also big producers of private labels. In the UK Tesco was the biggest seller of bottled water in 2019, shifting more than 801million, followed by Sainsbury's, which sold 314million bottles of water. In this case retailers are also obliged to forward the deposits into the “deposit account” and pay an EPR for each unit placed into the system.

- **Retailers pay the deposit to producers/ distributors at the wholesale stage;**

The deposit amount is then forwarded to the Scheme Operator.

- **Consumers pay the deposit to retailers, along with the price of the beverage;**

It is important that the deposit amount is always separately displayed from the products’ sales price. This way it is clear to the consumer that the deposit is neither a tax nor a price increase of the product, but fully refundable. Be it on the shelf or on the purchase/return receipt. The deposit amount is always displayed separately.

- **Consumers claim a full refund when they return their used beverage container to a designated return location;**

Consumers can claim a full refund at any point of sales in Ireland where beverage products and/or materials under scope are being sold.

- **The return location is reimbursed for the refunded deposit from the deposit account; and**

In addition to being refunded the paid-out deposit, retail further receives a handling fee to cover the direct costs associated to the collection of the used beverage containers. In average this handling fee is around 0.01€ - 0.03€.

- **The returned, used beverage containers are transported to be processed and recycled. The material can be used to manufacture new containers.**

As the collected used beverage containers are legally owned by the Scheme Operator, he is also responsible for the logistics behind moving the collected containers from the point of sale to the counting/sorting facility.

4. The preferred model for a DRS in Ireland:

The implementation of a DRS strongly relies on a strong **legal framework** set by the government defining clear responsibilities for producers, retailers and consumers, as well as ambitious collection targets and penalties.

Best results and prime transparency are accomplished if the **DRS is managed by a centralized not-for-profit organization**, mutually owned by the obligated stakeholders from beverage industry/importers and retail.

The stakeholders must bear 100% of the system costs as part of their Extended Producer Responsibility (EPR) obligation on a net cost basis, making it natural that they also legally own and operate the management organization. This management organization, or **Scheme Operator** can either be newly formed or under the umbrella of an existing EPR scheme.

In a recommended **return-to-retail scenario**, retail sets up the take-back infrastructure at the point of sale, in order to conveniently maximize accessibility for the consumer to return the used beverage containers. For this “service” provided to the DRS retailers receive a **handling fee**

associated to the direct costs of collecting the empty beverage containers. The handling fee is thereby differentiated between automated and manual return, as it follows the logic of value creation to the overall system.

As a result, the **ownership of the system is most commonly split between the producer and the retail sector**, as seen in the Nordics and Baltics. The beverage producers' interest is to keep the EPR fee as low as possible, whereas retailers' interest is to keep the handling fee as high as possible. In addition, retailers today are also big producers of private brands. In the UK Tesco was the biggest seller of bottled water in 2019, selling more than 801 million, followed by Sainsbury's, which sold 314 million bottles of water. The centralized DRSs' in Europe have thereby proven that splitting the ownership of the system between the two most crucial stakeholders to the system, leads to the most cost-efficient system set-up and operation, as well as balance of power between the respective stakeholders.

The aim of every DRS should be to operate at the lowest possible cost for all stakeholders involved, thereby maximizing economic efficiencies, system transparency and environmental benefits.

5. Details of the scheme to be set out in Regulations

Government Responsibilities:

Experience has shown that the best results and prime transparency is accomplished if the DRS is managed by a centralized non-profit organization, mutually owned by the obligated stakeholders from the beverage industry/importers and retail.

The stakeholders must bear the costs of the system as part of their extended producer responsibility (EPR) obligation and therefore it should be natural that they also set-up, run and own the SCHEME OPERATOR.

Experience from other markets has shown that government involvement should be limited to:

- providing a strong legal framework and responsibilities for producers, return points and consumers (governance),
- setting high collection and recycling targets and subsequent penalties for not reaching the targets,
- check the system results and if the desired targets are met,
- increasing the deposit value if collection targets are not met.
- accrediting the Scheme Operator through a public tender.

System Operator Responsibilities

In order to guarantee a transparent financial flow in the system, the SCHEME OPERATOR shall be responsible for:

- Collecting the admittance fee (annual or lifetime membership fee)
- Collecting the producer/importer fee per container.
- Collecting the deposit amount from the producer/importer/retailer (where applicable).
- Paying out the deposits to the return points.
- Paying out the handling fees to the return points.
- Paying for logistics companies for their collection services (logistics are typically outsourced to third parties).
- Paying for counting center services (if outsourced or partly outsourced).

Reporting of sales figures by producer/importer:

- Comparison of reported and independently audited sales figures to figures reported from RVMs (automated) and Industrial RVMs (counting center).
- Constant monitoring of sales and return figures by SCHEME OPERATOR in addition to independent audit.

Annual reporting:

1. Overview of balance sheet including, among other things, an overview of the three main income streams per material type (producer/importer fee/unredeemed deposits/material sales).
2. General overview of Profit/Loss calculation

Producer Responsibilities:

Producers need to:

- Register and become a member of the “Scheme Operator” → failing to do so will result in not being able to sell the beverage product on the Irish market.
- Pay an EPR fee to the Scheme Operator for each barcode (unit) placed onto the Irish market.
- Periodically provide System Operator with market sales data.
- Clearly mark beverage products with visual DRS marking.
- Apply a barcode on each beverage product (incl. Multi-Packs): either a unique Irish barcode only to be sold in Ireland or an open barcode (depending on Scheme Operator requirements)

Retail Responsibilities:

Retail needs to:

- Register and become a member of the Scheme Operator as official take back location and where applicable as beverage producer.
- Pay an EPR fee to the Scheme Operator for each barcode (unit) placed onto the Irish market.
- Periodically provide System Operator with market sales data.
- Provide System Operator with return/collection data from Reverse Vending System (RVS) in order to claim the paid-out deposits and handling fee.
- Separately display the deposit amount from the products sales price (product shelf, sales receipt, payout receipt).
- Provide sufficient and convenient space for collection means, incl. resources to maintain collection means.
- Clearly indicate where the used single-use beverage containers can be returned.
- Accept all materials covered by the scheme, irrespective of whether they were purchased on their premises or not;
- Fully refund the consumer the deposit amount.

- Claim paid out deposits from Scheme Operator based on collection data.

Consumer Responsibilities:

Consumers need to:

- Make sure that the beverage container is not substantially damaged/inflated.
 - Make sure the barcode on the container is clearly visible and not damaged.
- ➔ Failing to do so will result in no obligation to pay out the deposit.

The Deposit

It is crucial to take into consideration that the deposit level needs to have the right balance between being high enough to incentivize the consumer and low enough to discourage fraud.

- The deposit value should be related to the cost of living.
- In order to not having to change the deposit value ever couple of years, it should be set at a rate that still motivates the return 5-10 years from the introduction onwards.
- In light of the recent announcement by the Scottish Government, it is advised to set the deposit level at the same rate taking into account any potential future harmonization considerations between Scotland and the other potential systems in the UK, namely Northern Ireland.
- TOMRA recommends the **deposit value to be 0.2€**, based on experiences from other DRs, that have shown this amount is sufficient to quickly reach collection and recycling rates above 90%.
- The deposit amount should exclude VAT.

Deposit and Return Scheme

Draft Regulatory Framework

PART I – PRELIMINARY AND GENERAL

This part will contain the following:

- Citation and commencement- this is a standard provision in Irish legislation which states the basis of powers of the Minister to make these regulations;
- Interpretation- will define the main terms within the regulations;
- Scope- this will define the products to be covered by the scheme as PET plastic beverage bottles up to 3 litres in size and beverage aluminium cans.

PART II - PRODUCERS RESPONSIBILITY

This part will set out obligations of producers to establish a deposit and return scheme to meet Ireland's obligations to achieve a 90% separate collection rate for plastic PET bottles and to reach EU targets for aluminium can recycling. It will include the following:

- Definition of Producer for these Regulations;

Those economic parties or agents who are dedicated to both, filling of beverages into packaging or importation or purchasing of filled beverage packaging, for the purpose of placing them on the market.

Simply speaking, the first one bringing the container/barcode into and/or onto the market.

- All Producers will have to register with the approved body;
- Producers will be obliged to provide information in a prescribed format to the approved body relating to the amount of product they place on the market.

PART III - APPROVED BODY

This will set out the process of how a corporate entity applies to the Minister for approval as the DRS Operator (System Operator) on behalf of obligated producers, the grounds on which the Minister may accept, refuse or revoke such an application. It will contain the following:

1. An application to the Minister for approval will include:
 - Corporate credentials (Article of Association, CRO registrations etc),
 - List of proposed directors and officers of the body, 7
- Proposals relating to corporate governance,
- Proposals for representation of small and medium sized enterprises on the board of the approved body,
- A business plan in relation to the proposed scheme,
- A financial plan in relation to the proposed scheme,
- Proposals for a contingency reserve,
- Proposals relating to co-operation with other approved bodies,
- Proposals relating to retailer engagement and compensation,
- Proposals for exempting certain entities from the scheme and the grounds for such exemptions,
- A description of how the collection mechanism from consumers will be tailored to suit both large and small retail units,
- Criteria for selection of collection locations- other than larger retailer outlets,
- Proposals on how the deposit and refund is to be applied to products,
- Proposals in relation to the collection of materials for processing, ensuring the collection and recovery of the materials is recycled to a high standard,
- Proposals for the achievement of targets for the separate collection of PET plastic bottles (including a food grade recyclate),

- Proposal for achieving EU recycling targets for aluminium cans,
 - Proposals for submitting information, in such form and at such frequency as may be specified by the Agency or any other body who requires it for data reporting purposes,
 - Proposals in relation to public awareness campaigns,
 - Proposals detailing the nature and frequency of information (including financial accounts) to be submitted by the body concerned to the Minister or to such other person as may be specified by the Minister or, as appropriate,
 - An undertaking to explore the future potential of the scheme to incorporate other materials, and
 - Such other information as may be specified in writing by the Minister for the purposes of the Regulations.
2. The grounds on which the Minister may grant or refuse of approval;
 3. The frequency of a review of the scheme (currently 5 years for other EPR schemes);
 4. The grounds on which the Minister may revoke an approval

Part IV - FUNCTIONS AND POWERS OF THE APPROVED BODY (SYSTEM OPERATOR)

The functions and powers of the System Operator will include the following:

- Operate the DRS nationwide on behalf of its members on a not-for-profit basis;
- Responsibility for the effective carrying out of its functions;
- To receive any subscriptions or make charges to its members to provide for the effective carrying out of its function;
- Setting the level of any such subscription or charges which it may review from time to time;
- Issuing of a certificate of membership to all producers and retailers who fulfil their obligations under these Regulations;
- Ensure material collected from deposit locations is maintained separately from all other materials;
- Ensure PET bottles are recycled to a standard that achieves food grade quality;
- Support retailers in the management of collection infrastructure;
- Make recommendations to the Minister on the appropriate level of deposit;
- Provide such information regarding the operation of the approved body as the Minister may from time to time require;

- Provide information to the relevant local authority, nominated authority or, as appropriate, the Agency in such format and at such frequency as may be determined by the local authority, nominated authority or the Agency.
- Responsible for achieving the collection targets set by the government. Failing to achieve the collection rates results in a penalty.
 - Independent from the targets set out by the EU it is advised to set-up individual collection targets, thereby following a staggered approach:
 - Year 1 = 70%
 - Year 2 = 80%
 - Year 3 = 90%

The required collection and recycling targets provided by the EU shall serve as an absolute minimum base of what the DRS shall achieve. In 2019 in Ireland 41 cans and 46 PET bottles per capita go to waste. Combined those two represent 87 containers per capita. Containers which are disposed of incorrectly end up in nature or the marine environment, which could go into high quality collection and recycling. (ReLoop – What We Waste 2021)

PART V – RETAILER OBLIGATIONS

Retailers will be obliged to:

- Apply for membership of the scheme in a prescribed format;
- Display in a manner that is visible to all customers the certificate of participation in the DRS;
- Engage with the System Operator on the appropriate collection infrastructure for their outlet; [The Scheme Operator is responsible for setting the technical specifications, as well as rules and regulations with regards to the take-back technology.](#)
- Accept all materials covered by the scheme, irrespective of whether they were purchased on their premises or not;
- Collect the deposit in a manner to be agreed by the System Operator;
- Refund the deposit to consumers -in a manner to be agreed with the System Operator;
- Ensure the mechanism for recouping the refund from their premises is well advertised;
- Submit data in a prescribed format and frequency as required;
- Ensure the collection of scheme materials i.e. PET and aluminium cans from their premises.

➔ [See “Retail Responsibilities”](#)

PART VI – DEPOSIT

The provisions in relation to the deposit will include:

- The Minister will fix the deposit by regulation having considered recommendations from the approved body;
- The deposit may be varied by container volume and/or other factors as may be recommended to the Minister by the Scheme Operator;

- The Minister may amend the amount of the deposit on any item where it appears that the cost is insufficient to incentivise consumers to return items to the Scheme; → another mechanism that can be applied is the automatic increase of the deposit value (e.g. doubling the deposit amount), if the desired collection rates are not achieved.
- The Minister may also amend the deposit if it appears that the revenues returned to the Scheme are exceeding or are insufficient to cover operational costs;

A DRS is financed by three main income streams:

1. Producer Fee
2. Unredeemed deposit
3. Sale of collected material.

Costs within the system occur through:

- Retail handling fee;
- Transport and logistics costs;
- Transport packaging – plastic bags, containers, etc.;
- Counting centre costs;
- Administration costs;
- Depreciation on investments.

Ideally the collection of unredeemed deposits and the sales of collected materials should cover the total system costs. If this cannot be achieved, producers are obliged to cover the missing delta through an EPR Fee.

- Producers will ensure that the required marking as agreed with the Scheme are placed on their packaging;¹⁰ → Visual marking, as well as appropriate usage of required barcodes (domestic/international), including the application on multi-pack products.
- Participating retailers will be obliged to refund the deposit on all materials placed into their collection system regardless of whether they were purchased at their premises.
- The Scheme Operator is obliged to refund to the retail outlet the deposit amounts paid out to the consumer, including a handling fee.

PART VII - ENFORCEMENT

- Functions of Local Authorities
- Functions of EPA
Traditionally the EPA is appointed on behalf of the Government to oversee the compliance of the system.

PART VIII - MISCELLANEOUS

- Offences
Offences/fraud need to be penalized throughout all levels of the system. In a DRS there are three main levels of fraud that can occur, triggered by either the producer, retail store personnel, logistics companies or the consumer.

1. Front-end fraud: Under-reporting by the producer/importer resulting in less money entering the system and potentially resulting in an over-redemption of a specific product, resulting in a financial loss for the system. It is therefore important to constantly compare the sales data with the return data.
 2. Back-end fraud: Usage of wrong technology lacking appropriate security measures.
 - Automated return: Uncompacted beverage containers, which can be redeemed multiple times, for instance, by staff within the collection point.
 - Manual return: Theft of bags of uncompacted beverage containers either by store staff or logistics companies.
 3. Cross-border fraud: Particularly, when non-country specific barcodes or used.
- Penalties and Prosecutions
The aim of the DRS should be to maximise the collection quantity and quality of targeted materials, and subsequently increase the high-quality recycling rates through a broad range of beverage containers.

Setting legally binding high collection rates in combination with high penalties, if the targets are not met, gives the system the incentive to maximise its performance.

It is important that when targets are not met, the system is penalized. If penalties are not in place, the system is provided with an economic incentive to keep the collection rates low. Therefore, the penalty needs to exceed any economic gain the system could have from keeping the collection targets low.

It is therefore recommended to have in place sufficient penalties such as:

- Financial penalties
- Automatic substantial increase of deposit amount
- Progressive environmental tax

6. Appendix:

- TOMRA: Consultation Response 2020
- Reloop: What We Waste

For further information or clarifications please contact:

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