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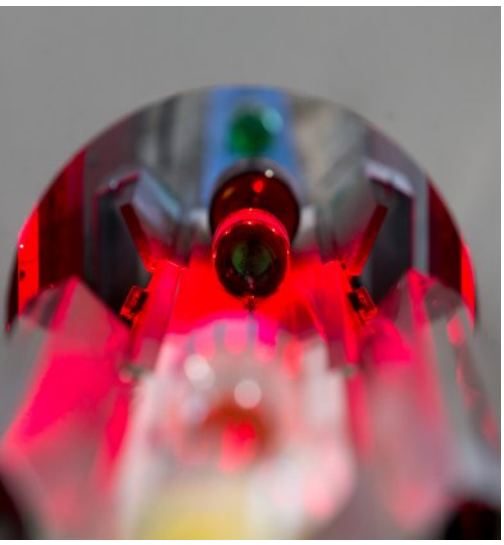
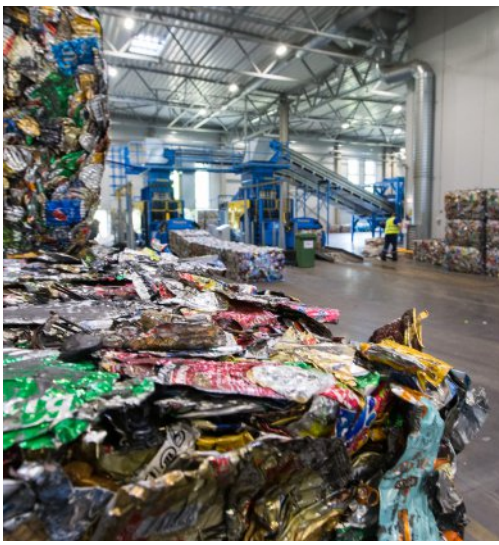
DEPOSIT-REFUND SYSTEMS IN EUROPE





FOR ONE-WAY BEVERAGE PACKAGING

JANUARY 2019

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The views expressed in this report are those of ACR+ only.

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NOTES AND TERMINOLOGY

Since Since exchange rates fluctuate, amounts are presented in national currency and indicative amount in EUR are shown in brackets based on the European Central Bank reference exchange rates – average half-yearly for 2018[1] as follows:

Country	ECB reference exchange rate, National currency/EUR, 2018 H1	
Croatia	Croatian kuna (HRK)	7.4637
Denmark	Danish krone (DKK)	7.4476
Iceland	Iceland krona (ISK)	123.47
Norway	Norwegian krone (NOK)	9.5929
Sweden	Swedish krona (SEK)	10.1508

Monetary amounts are in principle rounded to two digits after the dot.

Composite packaging: packaging made of "two or more layers of different materials which cannot be separated by hand and form a single integral unit" as defined by the EU Packaging Waste Directive[2] (2018/852)

Consumers: citizens/ customers who buy beverages in packaging on which deposit is payable, and receive it back upon return

Deposit-refund system (DRS): system whereby a consumer pays an additional (visible) amount of money – a deposit – for the packaging containing the beverage and can claim this money back if he returns it to an approved collection point.

Extended Producer Responsibility (EPR): policy principle in which producers' responsibility for their product is extended to all stages of the product's life cycle and in particular, to the post-consumer stage.

Producer Responsibility Organisation (PRO): collective organisation in charge of meeting individual producers' obligations arising from the application of the EPR principle.

One-way beverage packaging: beverage packaging intended to be used only once by the consumer.

Retailers: includes stores, shops, supermarkets that sell beverages to consumers and then accept the returned packaging on which deposit is payable, refunding the deposit back to the consumer.

Reverse Vending Machine (RVM): automated device which accepts empty beverage containers and issues a refund for a deposit amount attached to the container that has been previously paid

Producers: includes beverage manufacturers, breweries, importers and trademark owners. These are enterprises that package, import or sell packaged beverages in the course of their economic or professional activities.

1 European Central Bank – Reference rates [website]

2 Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste (Text with EEA relevance). 2018 [website]

INTRODUCTION

Some may remember days from their childhood when empty bottles of milk were waiting on the doorsteps for the milkman to replace them with filled ones. For others, such an image has a taste of the past, something they have seen in old movies, or heard in the stories of elderly relatives. Indeed, the practice of returning bottles has been established in many (European) countries already in the early 1900's[3]. In those times the system was quite common and part of everyday life of people. In expert language, this is referred to as a "deposit-refund system": system whereby consumers are required to pay a small deposit when they purchase a product, which they can get back if they bring it later on to a collection point.

For a long time the system was operating for refillable (glass) bottles – this was closely linked with local production of traditional beverages such as milk and beer. With the rise of consumerism and appearance of new materials on the market, over time the focus shifted from refillable to one-way beverage containers and packaging and packaging waste became an issue of increasing importance.

In 1994, the European Packaging and Packaging Waste Directive set mandatory minimum targets for recycling of packaging materials. This has led European Member States to take measures and put in place systems for collection and treatment of packaging waste. Most European countries have implemented the Extended Producer Responsibility (EPR) principle by putting in place a take-back scheme involving one or several Producer responsibility Organisations (PRO).

However, since the beginning of the 1990s when the first such schemes were introduced, the context has changed and new challenges have appeared:

1. Consumption patterns: rise of one-way packaging at the expense of refillables (notably beverage containers, takeaway cups, packaging for on-the-go consumption);

2. The problem of litter – marine and on land – has steadily grown worse and has gained the attention of politicians, wider public and NGOs;

In this context, a renewed interest in Deposit-Return Systems (DRS) has been growing, especially in the European Union with the publication by the European Commission of the Circular Economy Action Plan and new waste legislation, and even more recently with the European Parliament and European Council agreement on the Single Use Plastics Directive proposal[4]. More than ever, DRS is being in the spotlight of many discussions. Some see it as "the" solution to educating citizens, reducing littering and achieving high recycling targets thanks to high purity collected material, while others question whether the achieved environmental benefits are significant enough to offset the high economic burden placed on the industry. They claim that a well-established system, such as the existing European EPR schemes, delivers good results and would be put in danger by an additional DRS. Economic interests and political considerations can lead to a misinterpretation of facts and results. Meanwhile, a better understanding of the implications of a DRS on the existing municipal waste systems (including the existing EPR systems for

3 Colin Emmins, Soft drinks : Their origins and history, Grande Bretagne, Shire Publications Ltd, p. 9-10. 1991 [book]

4 European Commission – Single-use plastics: Commission welcomes ambitious agreement on new rules to reduce marine litter. 2018 [website]

packaging waste), of its effects on environmental awareness and its potential to change behaviours is needed to help making good decisions.

OBJECTIVES

• Provide an informative overview of existing DRS in Europe, relying as much as possible on facts and data, and based on existing examples and approaches. The focus is on a factual description of implemented systems, including concrete and practical aspects of implementation.

• Provide decision-makers with the background information they need to make sound and informed decisions, taking into account the specificities of their own situations.

QUESTIONS TO BE ADDRESSED AND SCOPE

• What are the existing experiences in this area?

• What can be learnt from them – is it possible to define elements of best practice that make a system successful?

• How does a DRS fit in the larger picture of waste management and policy on a territory?

The study focuses on one-way beverage packaging only. Reusable containers will be mentioned to the extent relevant, but they remain outside of the scope and are not adressed in details.

METHODOLOGY

The current report examines a number of DRS deployed at national scale. The case studies presented are diverse and cover different contexts in terms of population size and density, geography, political and legal approaches. The following ten countries in Europe with such systems are included in this report: Croatia, Denmark, Estonia, Finland, Germany, Iceland, Lithuania, The Netherlands, Norway, and Sweden.

The data collection was based on online search and publicly available electronic resources. The study relies on information already available, which consequently poses limitations in terms of exhaustiveness and comparability. On the other hand, the degree of availability of (public) information is also a defining element of a system.

An “External Advisory Board” composed of four member organisations representing public authorities, recyclers, academia and NGOs, has been following the data collection and analysis, providing feedback and enriching the study. The members of the Advisory Board provided feedback independent of each other.

European Environmental Bureau	NGO
Lund University	Academia
SUEZ	Recycler
Zero Waste Scotland	Public authorities

Once the information has been compiled and organised in individual country factsheets, a "Local reviewer" having a good knowledge of the country and the system has validated the data for each country. Rather than serving as a primary source of information, the direct contacts with relevant stakeholders from the respective countries aimed at validating data which had already been collected. The local reviewers mainly represent the operators of the DRS for each country and as such, have an insight into the functioning of the system and the information which is (publicly) available. In the cases where the DRS operator could not be reached/ did not respond to the request for support, the collected information was reviewed by a different stakeholder.

Country	Local reviewer	Type
Croatia	[anonymous]	Public waste management operator
Denmark	Dansk Retursystem	DRS operator
Estonia	Eesti Pandipakend Ministry of the Environment	DRS operator Ministry
Finland	PALPA	DRS operator
Iceland	Endurvinnslan	DRS operator
Lithuania	USAD	DRS operator
The Netherlands	Stichting Retourverpakking Nederland	DRS operator
Norway	Infinitum	DRS operator
Sweden	Returpack	DRS operator

A certain in number of elements have guided the collection of information and it was tried as much as possible to cover all of them in a consistent and comprehensive manner. However, this was not always feasible – for instance, because of lack of publicly available information or because of absence of direct contacts who could provide necessary information. For some countries, information has been more complete than for others. In addition, it was not always feasible or practical to delineate the information in the specific categories; some information is therefore presented in more general terms.

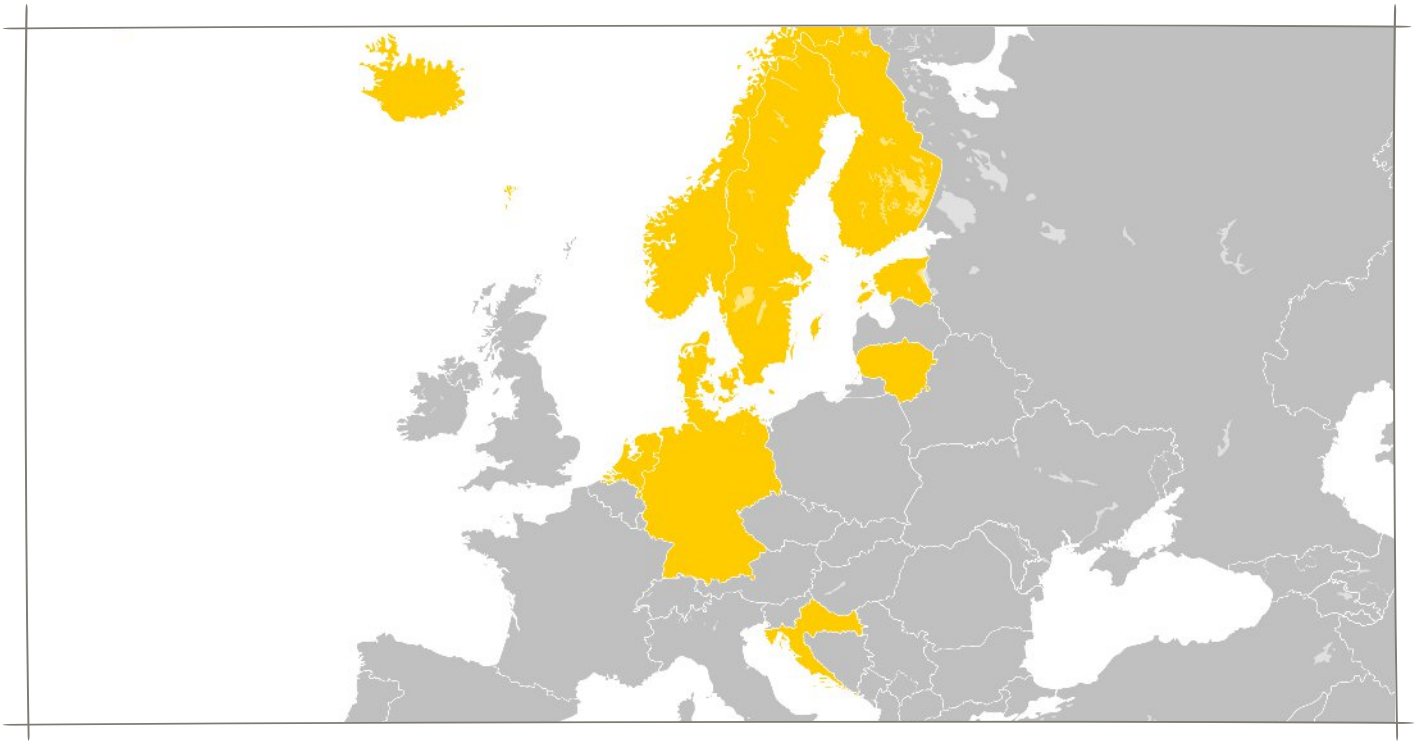
Description of the system:

- Background for introducing the system, political process behind introduction
- Legal basis, scope (beverages/ containers included in the system; size of the market), targets, links to other policies/ instruments
- How the system works: actors, roles and responsibilities, interactions between actors, system functioning, governance, enforcement, financing (revenue raised and allocation)

System results:

- Environmental: on littering, return/ recycling, eco-design, quality of material
- Economic: total costs and revenues, allocation
- Social/ behavioural: out-of-home consumption, effect on behaviour, perception by stakeholders

CASE STUDIES OF DRS



This report includes the following ten countries in Europe which have implemented DRS :

- Croatia
- Denmark
- Estonia
- Finland
- Germany
- Iceland
- Lithuania
- The Netherlands
- Norway
- Sweden

THE CASE OF CROATIA

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

In Croatia, the DRS came into effect in 2006 following the implementation of the Ordinance on Packaging and Packaging Waste of 2005. The decision was driven by increasing quantities of packaging waste since the 1990s as a result of rising use of non-refillable beverage packaging: PET, bottles, and cans. The EU Packaging and Packaging Waste Directive acted as an additional driver for this decision[5].

THE LEGAL BASIS, SCOPE, AND TARGETS. LINKS TO OTHER POLICIES OR INSTRUMENTS

The current main requirements for packaging waste in general and DRS specifically are set in the Ordinance on packaging and waste packaging (88/2015)[6] and the Regulation on management of waste packaging (97/2015)[7]. The legislation foresees that a deposit is established for one-way beverage containers of greater volume than 0.2l made of plastic (PET), metal (aluminium and iron) and glass containing alcoholic and non-alcoholic beverages, waters, fruit juices, and soft drinks. Milk and milk-containing beverages are subject to an exception and are excluded from the system. A returnable fee of 0.50 HRK [0.06 EUR] is to be applied per packaging unit regardless of the material and size.

The Ordinance establishes national recovery and recycling targets. In total, at least 60% of packaging shall be separately collected and recovered, of which at least 55% and up to 80% shall be materially recycled. Material-specific recycling targets are the same as the European targets[8] and there are no targets specifically applicable to packaging falling under DRS.

Main provisions regarding waste management in Croatia are laid down in the Act on Sustainable Waste Management (94/2013)[9] and by-laws focused on special categories of waste. The most important

5 The Croatian Parliament – Strategy of Waste Management in the Republic of Croatia. 2005. p.24 [law]

6 Article 22(1) Ordinance 88/2015 – Ministry of environmental protection and nature – Pravilnik o ambalaži i otpadnoj ambalaži (Ordinance on packaging and waste packaging). Official Gazette 88/15. 2015 [website]. Replaces previous Ordinance on packaging and packaging waste (Official Gazette 97/05, 115/05, 81/08, 31/09, 156/09, 38/10, 10/11, 81/11, 126/11, 38/13, 86/13)

7 Article 5 of the Decree 97/2015 – Government of the Republic of Croatia – Uredba o gospodarenju otpadnom ambalažom (Decree on the management of waste packaging). Official Gazette 97/15. 2015 [website]

8 60% of glass, paper and cardboard; 50% of metals; 22.5% of plastic (considering only the portion recycled back into plastics)

9 Law 94/2013 – Parliament of the Republic of Croatia – Zakon o održivom gospodarenju otpadom (Act on sustainable waste management). Official Gazette 94/13. 2013 [website]

strategic documents are the Waste Management Strategy 2005[10] and the National Waste Management Plan (2017-2020)[11]. In line with the provisions, municipal waste management system is based on the principle of separate collection: at source, via recycling yards, on public spaces. Packaging waste is considered as "special category of waste" subject EPR.

In 2003, the Environmental Protection and Energy Efficiency Fund (hereinafter "FZOEU")[12] has been established with the purpose to secure resources for the financing of projects and activities in the field of "conservation, sustainable use, protection and improvement of the environment". It operates as a structured extra-budgetary fund: the budget of FZOEU is separate from the national budget and cross-financing is not allowed and fees collected for waste management should be strictly dedicated for such purposes. In the area of waste management, FZOEU is in particular responsible for the special categories of waste subject to EPR, including packaging. For this, FZOEU manages the system of collection and financing via EPR fees. Local authorities are responsible for securing the public service of collecting municipal waste[13].

The system for non-deposit bearing packaging is part of the system of collection and treatment of special categories of waste managed by FZOEU. The waste management fees payable by producers to FZOEU depend on the type and quantities of packaging material placed on the market.

Table 1 : Waste management fees[14]

Material	Fee per tonne
PET	410.00 HRK [55.53 EUR]
Aluminium cans	410.00 HRK [55.53 EUR]
Iron cans	225.00 HRK [30.47 EUR]
Paper, cardboard	375.00 HRK [50.48 EUR]
Composite packaging used for beverages	410.00 HRK [55.53 EUR]
Composite packaging for other uses	750.00 HRK [101.58 EUR]
Plastic bags	1,500.00 HRK [202.12 EUR]
Polymers for milk and milk-containing products	410.00 HRK [55.53 EUR]
Other polymers	750.00 HRK [101.58 EUR]
Glass	150.00 HRK [20.31 EUR]
Wood	150.00 HRK [20.31 EUR]
Textile	150.00 HRK [20.31 EUR]

10 Strategy 130/2005 – Parliament of the Republic of Croatia – Strategija gospodarenja otpadom Republike Hrvatske (Waste management strategy). Official Gazette 130/2005. 2005 [website]

11 Decision 3/2017 – Government of the Republic of Croatia - Odluka o donošenju Plana gospodarenja otpadom Republike Hrvatske za razdoblje 2017. - 2022. Godine (Decision on the adoption of the Waste Management Plan of the Republic of Croatia for the period 2017 – 2022). Official Gazette 3/2017. 2017 [website]

12 The Act on the Environmental Protection and Energy Efficiency Fund was published in the Official Gazette 107/03 and it is applied as of 1 January 2004. It was established under the provisions of the Environmental Protection Act (82/94 and 128/99) and the Energy Act (68/01).

13 Government of the Republic of Croatia – Waste Management Plan of the Republic of Croatia for the period 2017-2022. 2017 [report]

14 Article 7 (2) of the Decree 97/2015 – Government of the Republic of Croatia – Uredba o gospodarenju otpadnom ambalažom (Decree on the management of waste packaging). Official Gazette 97/15. 2015 [website]

FZOEU finances the service of collection and transport of packaging waste and reimburses the companies authorised for collection and storage of the packaging waste. The amount of refunds depends on the conditions agreed in the contracts of FZOEU and authorised collectors. FZOEU is owner of the collected packaging waste and sells it to authorised recyclers. So far, it has concluded contracts with 27 authorised collectors and 8 authorised companies for recovery and recycling of packaging waste.

In addition, there is a parallel system of collection and treatment of packaging waste where collectors and recyclers are not paid by FZOEU and operate on market basis.

System functioning, roles and responsibilities of main stakeholders

Deposit operator

FOND ZA ZAŠTITU OKOLIŠA I ENERGETSKU UČINKOVITOST

Since the introduction of the system, FZOEU is responsible for activities related to management of packaging and packaging waste more generally and the DRS in particular. FZOEU is a public authority, responsible for collecting and investing extra budgetary resources in the programmes and projects of environmental and nature protection, energy efficiency and use of renewable energy sources.

The responsibilities of FZOEU related to the management of the DRS are the following[15]:

- Return to the retailers the deposit (0.5 HRK [0.06 EUR]) paid to the customers;
- Compensate the incurred retailer's costs due to handling of the returned one-way packaging (0.1 HRK [0.013 EUR] per each packaging collected manually and 0.12 HRK [0.016 EUR] per each package collected via RVM);
- Check and approve compatibility of the packaging to be collected via RVM;
- Collect data and deposit amounts from the producers;
- Enter into an agreement with authorised collectors and agree on the manner of payment of collection and transport costs;
- Enter into an agreement with authorised recyclers and agree on the manner of selling collected packaging.

In 2015, FZOEU expected to collect 396 million HRK [53.61 million EUR] for carrying out waste management activities in general (not exclusively from the DRS). Regarding the DRS, FZOEU had foreseen part of this money for an introduction of RVM with compression starting in 2014 as no compression of the containers has been performed until then[16].

FZOEU pays a handling fee to the retailer who takes back the beverage packaging back from the consumer, per unit of deposit-bearing packaging (both one-way and reusable containers):

- 0.10 HRK [0.013 EUR] for manual collection

15 Fond za zaštitu okoliša i energetsku učinkovitost (FZOEU) – Activities of the Fund [website]

16 Fond za zaštitu okoliša i energetsku učinkovitost (FZOEU) – Program rada Fond za zaštitu okoliša i energetsku učinkovitost za 2015. godinu (The programme of the Environmental Protection and Energy Efficiency Fund for 2015). 2015. p. 58 [report]

- 0.12 HRK [0.016 EUR] for collection using reverse-vending machines[17]

At the beginning of the implementation of the system, no labels were applied and bigger amounts of containers ended up in the system claiming reimbursement of fees (eg. containers which were produced in a previous period, or imported from abroad, or specifically manufactured for the return of the fee). As a result, between January and October 2006, FZOEU systematically paid more money as a refund to the retailers as compared to the amount collected from producers. In addition, some producers managed to avoid paying deposit fees. This all resulted in a reported deficit of over 41 million EUR[18]. Until 2008, FZOEU has established some level of control through the use of labels and barcodes[19].

Producers[20]

Upon placing products on the market, producers become obliged to pay the deposit amount to FZOEU, based on the data that producers are required to submit to FZOEU. In addition to the deposit amount, producers also pay waste management fees depending on the type and quantities of packaging material (Table 1).

The monthly report should include data on the quantity of packaged products as well as quantities of products exported and withdrawn from the market. In accordance with the submitted data, the producer issues a payment to FZOEU on the last day of the month.

Before placing a new beverage product on the market, the producer shall notify FZOEU and provide certain product specifications and as well as a product sample. Among others, the specifications shall include a barcode, GTIN number as well as the packaging type. The provided sample of the product is used to evaluate whether the product label is in conformity with the obligations set out by the Ordinance: the marketed product shall include an indication of the packaging material, the recycling mark, the GTIN number, as well as the DRS symbol.

Retailers[21]

Retailers selling packaged beverages are obliged to collect the returned deposit-subjected packaging and refund the deposit to the consumers. Stores with an area larger than 200 m2 are subject to this obligation. Retailers whose sales area is smaller than 200 m2 may decide to participate in the DRS provided they are approved by FZOEU, subject to meeting certain technical requirements related to the availability of space for acceptance and storage of the packaging.

17 Article 6of the Decree 97/2015 – Government of the Republic of Croatia – Uredba o gospodarenju otpadnom ambalažom (Decree on the management of waste packaging). Official Gazette 97/15. 2015 [website]

18 Bottle Bill Resource Guide – Croatia [website]

19 Portal Novosti – Ministrica zaštite okoliša najavila ukidanje povratnih naknada za ambalažu (The Minister of Environmental Protection announced the abolition of refundable packaging fees) 2012 [website]

20 Article 23 of the Ordinance 88/2015 – Ministry of environmental protection and nature – Pravilnik o ambalaži i otpadnoj ambalaži (Ordinance on packaging and waste packaging). Official Gazette 88/15. 2015 [website]

21 Article 24 of the Ordinance 88/2015 – Ministry of environmental protection and nature – Pravilnik o ambalaži i otpadnoj ambalaži (Ordinance on packaging and waste packaging). Official Gazette 88/15. 2015 [website]

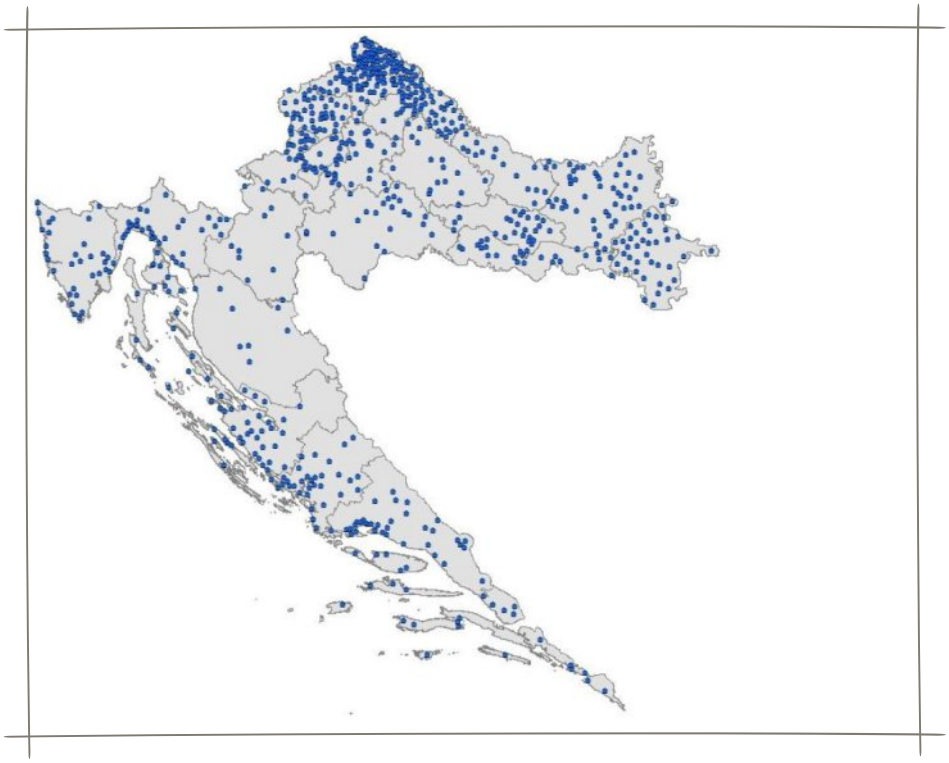


Figure 1 : Places in which packaging waste is collected through the DRS system[22]

The reception of deposit-subjected packaging and the refunding of deposits may be organised in either manual or mechanical way, using RVMs. The place of reception shall be clearly indicated to consumers. The retailer is required to collect and store data on the amount of returned packaging and submit it to FZOEU once per month. As indicated above, FZOEU provides refund for the collected packaging as well as incurred handling expenses to the retailer based on the submitted information. Upon entering into an agreement with FZOEU, waste collection services collect the returned packaging subject to deposit from the retailers.

Until 2014, containers collected through a RVM were not compressed. In 2014, the first pilot project was implemented with the aim to demonstrate the economic feasibility and the level of control with this type of collection. By the end of 2015, it was planned that this type of collection accounts for 40% of total collected quantities. In a longer term, it was foreseen that this would decrease the burden on authorised collectors by 60% and the burden on counting centres by 68%. The plan also foresees that the sellers would face differentiated fees and that they will take the burden of procuring the specially assigned bags for collection outside of a RVM system[23].

Consumers[24]

Consumers pay a deposit on beverage container, included in the price of the beverage. They may return the packaging to a retailer and collect the deposit amount if the returned packaging is not damaged and bears barcode as well as DRS symbol.

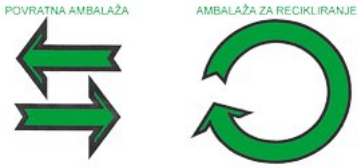
When consumers return one-way packaging that is included in DRS (beverages) they get paid 0.50 HRK [0.06 EUR] from retailer. When consumers return reusable packaging (beverages) they can buy another beverage in the same packaging without paying cost of the bottle.

22 Agency for Environment and nature of the Republic of Croatia – Izvješće O Gospodarenju Otpadnom Ambalažom (Report on the management of waste packaging). 2016. p. 13 [report]

23 Fond za zaštitu okoliša i energetsku učinkovitost (FZOEU) – Program rada Fond za zaštitu okoliša i energetsku učinkovitost za 2015. godinu (The programme of the Environmental Protection and Energy Efficiency Fund for 2015). 2015. p. 58 [report]

24 Article 25, Article 14 of the Ordinance 88/2015 – Ministry of environmental protection and nature – Pravilnik o ambalaži i otpadnoj ambalaži (Ordinance on packaging and waste packaging). Official Gazette 88/15. 2015 [website]

There are separate standardised labels for one-way and for reusable beverage packaging, prescribed in the legislation[25]. Reusable packaging has label REUSABLE PACKAGING (POVRATNA AMBALAŽA) and related sign.



DRS packaging has label DEPOSIT FEE (POVRATNA NAKNADA) and associated sign.

Supervision

No concrete mechanism is available to ensure that there is no free riding and more generally it is noted that there is a lack of monitoring instruments.

25 Annex 6 of the Ordinance 88/2015 – Ministry of environmental protection and nature – Pravilnik o ambalaži i otpadnoj ambalaži (Ordinance on packaging and waste packaging). Official Gazette 88/15. 2015 [website]

RESULTS

In 2014, a total of 93.6% of bottles and cans placed on the market were recovered through the DRS model. The subsequent years demonstrated high results as well[26]. In 2015, 77% of PET, 86% of glass and 89% of metal containers were returned. The outcomes in 2016 reached the collection rate of 96% for PET, 82% for glass, and 86% for metal. According to the information provided by FZOEU, almost all collected packaging waste (99.99%) were recycled[27].

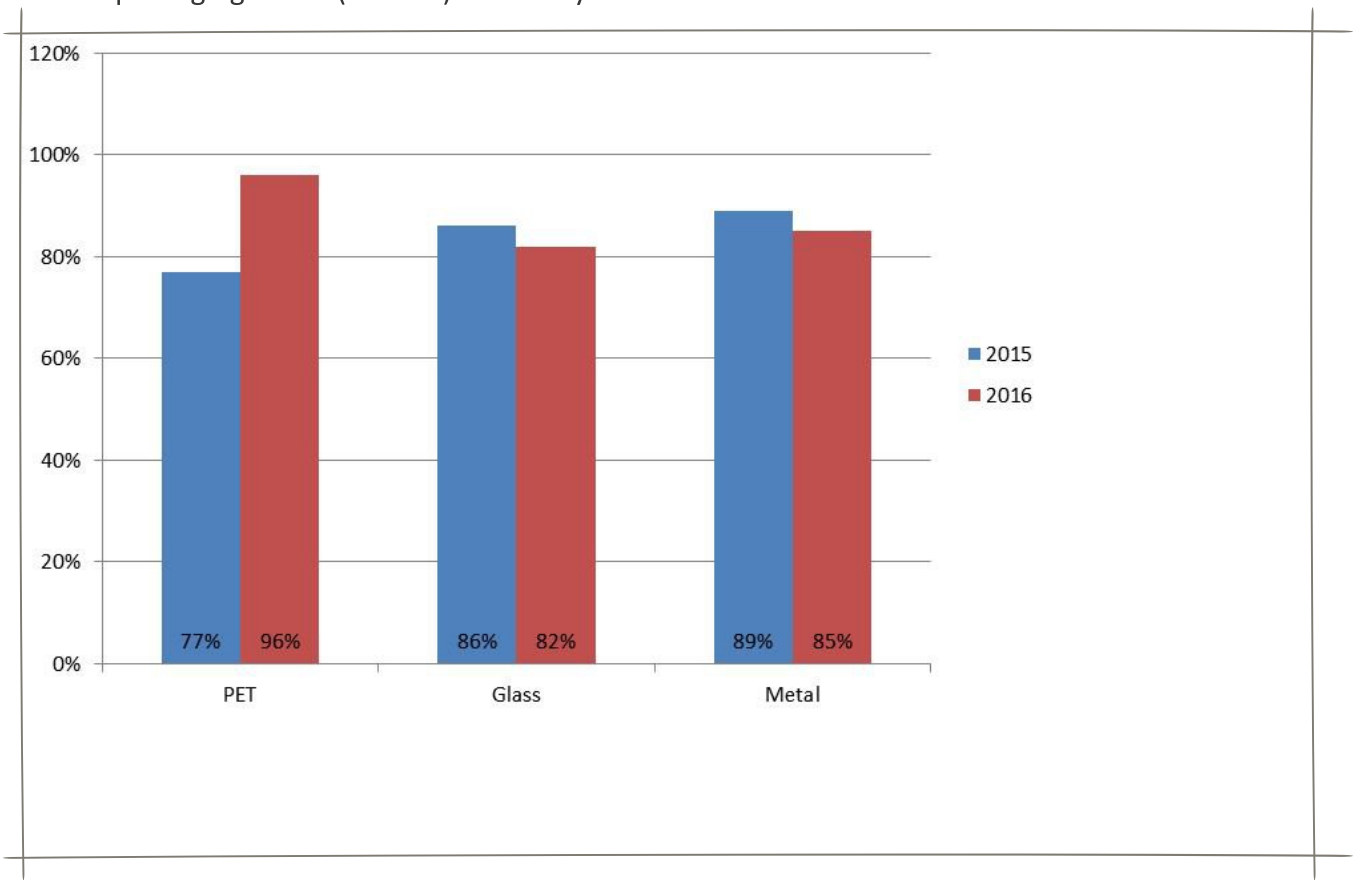


Figure 2 : collected packaging per material in 2015 and 2016[28]

A public report on realisation of FZOEU program for 2015 provides data on management of packaging waste in general, not specifying the cost coverage of the DRS system and non-DRS system separately. It is stated that, in 2015, FZOEU had an income of nearly 505 million HRK [86 million EUR] from producer fees and 21.5 million HRK [2.8 million EUR] from waste packaging sale to recyclers, thus having a total income of 526 million HRK [70.5 million EUR]. Total expenses in 2015 for packaging waste were 484 million HRK [65 million EUR][29].

This numbers show that management of the packaging waste are fully covered by fees collected from producers but it is not clear if the DRS system is self-sufficient.

26 Fond za zaštitu okoliša i energetsku učinkovitost (FZOEU) – Gospodarenje otpadom (Waste management) [website]

27 Agency for Environment and nature of the Republic of Croatia – Izvješće O Gospodarenju Otpadnom Ambalažom (Report on the management of waste packaging). 2016. p. 7 [report]

28 Agency for Environment and nature of the Republic of Croatia – Izvješće O Gospodarenju Otpadnom Ambalažom (Report on the management of waste packaging). 2016. p. 12 [report]

29 Fond za zaštitu okoliša i energetsku učinkovitost (FZOEU) – Home [website]

THE CASE OF DENMARK

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

DRS for refillable bottles for beer and carbonated drinks in Denmark date back to 1910 when breweries put in place schemes to reduce the cost of reusing bottles. In the 1950s, the Government started regulating the schemes[30]. Since 1989, it was required[31] that containers produced in Denmark are refillable, participate in a DRS, and are approved by the Danish Environmental Protection Agency (EPA). The purpose of these mandatory systems was to limit waste from packaging by encouraging the reuse of beverage containers. The return rates were reaching over 99% and the average number of times a glass bottle was reused was 35-40[32].

The incentives to introduce the current DRS (which applies both to refillable and one-way containers) came from EU infringement proceedings. Up until 2002, beer and carbonated soft drinks were required by Danish law to be marketed in refillable packaging only and canned beverages were not allowed in the country (often referred to as the "can ban"). As a consequence of EU infringement proceedings against Denmark, the Danish government decided to drop this requirement and, thus, one-way packaging for beer and soft drinks were introduced on the Danish market[33].

The basis for the current DRS was set in 1995 when the beer and soft drinks producers and the retail sector entered into a formal collaboration in order to establish a common DRS for beverage containers (which at the time were primarily refillable glass bottles). As a result of this collaboration, a privately-owned company, Dansk Retursystem, was founded in 2000. Since 2002, Dansk Retursystem has been granted the exclusive right to operate a national DRS until 2022 (subject for renewal every 6 years). With the establishment of Dansk Retursystem, the pre-existent DRS for refillables was extended to beer and soft drinks in non-refillable bottles, as well as cans that contained certain types of beverages.

During the establishment of the DRS, the influence of big Danish beer producers on the scheme was heavily criticised. The argument was that the owners, through their majority share in Dansk Retursystem, would be able to access confidential sales data about their (foreign) competitors and thereby seek to exclude them from the market. However, confidential data is handled under strict third party procedures

30 Norden – The Use of Economic Instruments In Nordic Environmental Policy 2010–2013. Nordic Council of Ministers 2014 [report]

31 Statutory Order no. 124 of 27 February 1989

32 Environmental Protection Agency – Environmental Factors and Health. 11 Waste [website]

33 DAKOFA – Reuse and recycling in Denmark [website]

on behalf of Dansk Retursystem and to this date no cases of brand-specific or other interested parties having gained access to such information have been confirmed.

Criticism was also raised on the monopoly granted to Dansk Retursystem which was considered by some as possibly distorting competition[34]. However, regular audits conducted every three years have concluded that Dansk Retursystem is cost-effective and, thus, the format of the DRS in Denmark should not be changed. The latest one carried out in 2016 by the auditing and consultancy firm PricewaterhouseCoopers (PwC) conducted an analysis of the company based on environment, efficiency and stakeholder satisfaction. On the basis of this analysis, the Danish EPA decided to extend Dansk Retursystem's exclusive rights until the end of 2022[35].

In 2017, the Danish EPA and the Competition and Consumer Authority conducted a market consultation to determine whether there are other companies potentially interested in operating the Danish DRS, as well as to get broader feedback on possible improvements of the system. The consultation revealed that there are no companies interested in running the DRS in its current setup but several would be in a changed setup (notably if the requirement on non-for-profit nature of the operator is dropped)[36].

The Legal basis, scope, and targets. Links to other policies or instruments

The most recent regulation establishing the framework of the DRS is the Statutory Order on Deposits[37] implemented in 2002. It was adopted pursuant to a number of provisions in the Consolidation Act on Environmental Protection[38]. It establishes the organisation, roles and financing of Dansk Retursystem as well as defines the scope of the DRS, sets the minimum deposit values for different types of packaging and establishes collection targets for refillable packaging, butno targets are mentioned for one-way packaging. The deposit values depend on the type of material, the volume of each container and – in the case of a glass bottle – whether it will be recycled or reused.

Table 1: Deposit values for different packaging types[39]

Type of container	Metal cans		Plastic bottles		Glass bottles			
Container volume	One-way		One-way and Refillable		One-way		Refillable	
	< 1 l	≥ 1 l	< 1 l	≥ 1 l	< 1 l	≥ 1 l	< 0.5 l	≥ 0.5 l
Deposit value	1 DKK [0.13 EUR]	3 DKK [0.4 EUR]	1.5 DKK [0.2 EUR]	3 DKK [0.4 EUR]	1 DKK [0.13 EUR]	3 DKK [0.4 EUR]	1 DKK [0.13 EUR]	3 DKK [0.4 EUR]

The deposit is applicable to metal cans, plastic and glass bottles if they contain: beer; carbonated drinks (mineral water, lemonade and others); mixer products of non-alcoholic beverages with spirits (alcoholic soft drinks) and other fermented beverages (these products have been included in the scheme in 2005);

34 Environmental Resources Management – Review of Packaging Deposits System for the UK, Annex A: Review of Member State Experience: Denmark. 2008. pp. A2 – 8 [report]

35 Dansk Retursystem – Annual Report 2016 [report]

36 Kammeradvokaten – Report on the market consultation for the operation of a deposit and return system in Denmark. 2017 [report]

37 Statutory Order 2017 – Statutory Order on Deposits on and the Collection etc. of Packaging for Certain Beverages. 2017 [order]

38 Environmental Protection Agency – Market consultations regarding the operation of a deposit return system in Denmark held by the Danish Environmental Protection. Ministry of Environment and Food of Denmark. 2017 [report]

39 Statutory Order 2017 – Statutory Order on Deposits on and the Collection etc. of Packaging for Certain Beverages. 2017 [order]

Consolidated Act 2017 – Consolidation Act on Environmental Protection. 2017 [act]

and non-carbonated soft drinks including mineral water, lemonade, ice tea (these products have been included in the scheme in 2008).

The following drinks are excluded from the system: fruit squash/cordial, juice, milk, cocoa, wine and spirits. Juice and milk drinks are excluded mainly for hygiene reasons. Wine and spirits bottles are generally not considered as an environmental problem, and the wine producers and importers have not expressed any interest in being part of the deposit scheme[40]. Beverage cartons, packaging containing more than 20l as well as plastic containers larger than 10l containing non-carbonated water are excluded from the system.

In 2018, the Danish government announced that the deposit system will be expanded to include bottles used for fruit juices and fruit concentrates. The expansion will enter into force on 1 January 2020[41].

The Statutory Order establishes that providers who use reusable containers must ensure their collection.

There is no producer responsibility scheme for packaging in Denmark[42] and the collection of the remaining packaging falls under the responsibility of municipalities. Municipalities should provide collection schemes for recyclable glass, metal and plastic packaging waste but there are no requirements regarding the collection method. Separate collection is not mandatory as long as the majority of the fractions are recycled, which makes separate collection the preferred option for municipalities. Glass, plastic, metals, paper and cardboard have traditionally been collected via bring banks or civic amenity sites, but because of stricter recycling requirements[43], these fractions are increasingly collected door-to-door[44]. There are no links between these collections and the DRS. However, Dansk Retursystem yearly reports the collected volumes of deposit-labelled packaging in the national waste register (set by the Danish EPA) since the packaging is defined as household waste. The report of the volumes is divided into each municipality.

System functioning, roles and responsibilities of main stakeholders

Deposit operator

The DRS operator is Dansk Retursystem. It was established in June 2000 to operate the DRS for refillable glass bottles. As of 2002, it has been granted the exclusive rights to operate the DRS in Denmark on the conditions laid down in the Statutory Order. Regulated by the Ministry of Environment, the company is run on a non-for-profit basis. It was established by a number of breweries together with the Danish retail trade and it is owned by the producers[45]:

- Dansk Retursystem Holding (85.62%), owned by Carlsberg, Royal Unibrew, Thisted Bryghus and Bryggeriet Fuglsang

40 Environmental Resources Management – Review of Packaging Deposits System for the UK, Annex A: Review of Member State Experience: Denmark. 2008. pp. A2 – 8 [report]

41 Ministry of Environment and Food of Denmark – Deposit on juice and fruit drink concentrate packaging [website]

42 PRO Europe – Packaging waste legislation in Denmark [website]

43 The Danish Government has set a goal to recycle 50% of household waste by 2022. Ministry of Environment and Food of Denmark – Waste [website]

44 DAKOFA – Reuse and recycling in Denmark [website]

45 Environmental Protection Agency – Market consultations regarding the operation of a deposit return system in Denmark held by the Danish Environmental Protection. Ministry of Environment and Food of Denmark. 2017 [report]

- Harboes Bryggeri (14.27%)
- Bryggeriet Vestfyen (0.1%)
- Mineralvandsfabrikken Frem (0.01%)

The Board of Directors of Dansk Retursystem's represents the key partners in the Danish DRS: the breweries, the importers of beverages on which deposits are payable and the retail trade, which is required to receive the empty bottles and cans returned by consumers.

The main tasks of Dansk Retursystem are to register one-way packages subject to deposit, collect[46] those once they are empty, count, sort, compress and ensure their recycling, to pay deposits and handling remuneration for this packaging to stores, as well as to streamline the overall management of the system (including by introducing new solutions to collect empty beverage packaging). These tasks cover the provision of necessary capacity to collect and count empty one-way packaging, including land areas and buildings, as well as the necessary technical equipment and installations. Dansk Retursystem owns the background equipment[47] of the RVM installed in stores and loans/ leases it to retailers (while the RVM are owned by retailers themselves). Dansk Retursystem also internally performs the collection[48] of the empty packaging from retailers and operates two factories with equipments mainly for mechanical counting and separation of packaging[49].

Dansk Retursystem has also been granted with a number of authority rights: it is obliged to carry out regular controls to ensure compliance with the regulation on marking one-way packaging, collection and payment of deposits, as well as registration of providers and intermediaries. Controls shall be carried out by means of observation at sites that are accessible by the general public and certain penalties are foreseen in case of non-compliance. Fines and/or penalties are handled by the Danish EPA or the Danish Tax authority depending on the situation. In general, the level of non-compliance noted by Dansk Retursystem is low.

In addition to the abovementioned tasks, Dansk Retursystem carries out information campaigns about the DRS in Denmark. The campaigns focus on the environmental benefits of recycling as well as the fact that the consumer gets his/her deposit back. The legislation allows for surplus deposits to be used, amongst others, on information campaigns to help improve environmental awareness and increase the return rate.

Dansk retursystem has about 460 employees, including a large number of drivers since it carries out the transport itself.

Dansk Retursystem has three main sources of income:

- Unredeemed deposits;
- Operating fees paid by producers and importers to Dansk Retursystem for each item of packaging marketed in Denmark or exported with marking pursuant to the Statutory Order on Deposits;
- Scrap income from material sales of packaging collected by Dansk Retursystem.

Other income comprise a packaging registration fee (paid by producers), annual admission fee (paid by

46 The collection of refillable bottles falls under the responsibility of producers. Dansk Retursystem – Om genpåfyldelige emballager (About refillable packaging) [website]

47 The background equipment consists of compactors, sealed container systems and central control units; a technical unit which can communicate between stations for acceptance of returns and Dansk Retursystem and can pass on data.

48 Previously, collection was subcontracted but is now performed internally; except for the areas where it is not practicable for Dansk Retursystem to do so (in which case external suppliers are charged with the collection).

49 Separation refers to separating plastic bottles and cans which are collected in the same bag (mixed) from other places than stores (cafes, restaurants,

retailers), a fee for wasted journeys (to be paid by a retailer in case Dansk Retursystem is not able to carry out a planned collection of packaging due to circumstances attributed to retailers (failure or inadequate preparation of packaging, inadequate clearing of snow or rejection of collection, etc.), payment for collection equipment, lease of compactors, refunded costs for confiscated goods, and payment for costs of printing deposit labels.

Table 2: Financing distribution[50]

	Financial statements 2017 in million	Financial statements 2017 %
Unredeemed deposits	173.6 DKK [23.31 EUR]	31.7%
Operating fees	245.5 DKK [32.96 EUR]	44.8%
Scrap income	116.8 DKK [15.68 EUR]	21.3%
Other income	11.5 DKK [1.54 EUR]	2.1%
Total	547.4 DKK [73.5 EUR]	100%

Operating fees paid by producers for the beverages they sell on the Danish market are set and adjusted on an annual basis. They are required to reflect the exact costs of operating and administering an efficient DRS (covering collection and logistics) and are, therefore, calculated based on the expenditure of Dansk Retursystem versus the income. The calculation is based on each packaging type, depending on its material and size. The general principle is that every packaging is covering its own cost. As of July 2018 Dansk Retursystem introduced a "circular economic fee structure" meaning that less recyclable packaging is paying higher fees[51].

The Statutory Order specifies how Dansk Retursystem can spend its revenues resulting from non-collected deposits. For the period between 2015 and 2019[52], it must annually pay to the state parts of these unredeemed deposits which the company can post as revenue. In addition, Dansk Retursystem must pay an annual amount to the Danish EPA to cover documented expenses incurred by the Danish EPA and the customs and tax authorities for supervision, control, and administration of the deposit and return system. The remaining revenue might be used to cover the collection of packaging which is not registered with Dansk Retursystem or which is not covered by the Statutory Order, upon decision of the Danish EPA. Additionally, the company may use the revenues from unredeemed deposits to finance grants for public interest purposes, including establishing environmental measures, teaching, information, research, and other relevant environmental projects[53].

Producers

Breweries and suppliers who produce or import filled packaging for the Danish market are obligated to register themselves and the products they want to sell on the Danish market, as well as to report their

etc.). Website of the Dansk Retursystem [website]

50 Environmental Protection Agency – Market consultations regarding the operation of a deposit return system in Denmark held by the Danish Environmental Protection. Ministry of Environment and Food of Denmark. 2017 [report]

51 Dansk Retursystem – Implementering af ny gebyrmodel (Implementation of a new fee model) [website] and Gebyrer (Fees) [website]

52 The amendment related to this provision was introduced to the Environmental Protection Act of 2006 in 2016 edition. According to the Dansk Retursystem report (2016), the payments to the state will cease after 2019.

Executive Order 2016 – Executive Order of the Environmental Protection Act. 2006. Amended in 2016 [order] and

Dansk Retursystem – Annual Report 2016 [report]

53 If the amount from the unredeemed deposits cannot cover or can only cover partly the expenses related to payment to the Danish EPA to cover administrative costs and coverage for collection of packaging which is not registered with the DRS and is not covered by the relevant legislation, the packaging fees can be used for this purpose.

sales to Dansk Retursystem. The registration takes place by completing a registration form which is available electronically on Dansk Retursystem website. The registration fee is 2,000 DKK [268.57 EUR] per packaging, payable upon first packaging registration in a calendar year, further registration of other packaging during the same year and by the same producer are free. Upon registering the new one-way packaging, producers submit two or more samples to Dansk Retursystem, which are used to ensure that the deposit is correctly scanned and refunded. The packaging has to bear a deposit mark for non-refillable containers, consisting of several elements: a logo with two arrows illustrating that the one-way packaging is part of a deposit and return system; a letter indicating the deposit payable for the one-way packaging in question; the word "Pant" (deposit); a deposit code consisting of five black dots. In addition to the deposit mark, an EAN barcode and a GTIN shall be added to ensure that the packaging can be scanned electronically in the RVM.

Producers must consider one of two options for labelling their packaging as deposit refundable: (1) direct printing onto the packaging or onto the original product label; (2) or self-adhesive deposit labels. Depending on the labels chosen producers pay operation fees or average fees[54].

Importers and producers of refillable bottles must have in place and operate a return system themselves. This involves arranging the collection in appropriate crates and trays at the party to whom the provider has marketed the packaging, washing, and refilling of bottles, therefore meeting a return rate of 98%. Return figures must be sent directly to Dansk Retursystem. Providers who accept refillable packaging shall ensure that the packaging is recycled when the packaging can no longer be re-used. No markings are needed for the refillable packages.

In 2017, 990 producers and importers were registered by Dansk Retursystem[55].

Retailers

Retailers selling packaging subject to deposit are required to accept returns and pay a refund to consumers, if the following conditions have been met:

a) One-way packaging: Stores with RMVs must accept all types of one-way packaging with the Danish deposit label. Stores without RVMs that sell beverages must accept the same types of packaging materials as the ones that they sell (e.g. cans for cans, plastic for plastic etc.) regardless of the product brand[56].

b) Refillable packaging: Stores must accept refillable packaging if it corresponds to the shape of the packaging that they sell or if it can be sorted into crates and trays together with the marketed types of packaging.

Repayments of deposits on non-refillable packaging to retailers are handled exclusively by Dansk Retursystem. To ensure this, retailers selling beverages in deposit-subject packaging must register with Dansk Retursystem against an annual administration fee of 500 DKK [67 EUR]. This is used to cover the costs related to retailers' registration, calculation of handling remuneration and alike and also ensures packaging is collected from retailers free of charge by Dansk Retursystem. A total of 15,500 sales locations (stores, restaurants, and offices) are registered in the system. Temporary outlets such as music festivals and sports tournaments can also seek registration.

Incurred retailer's costs due to handling of the returned packaging are compensated by Dansk Retursystem if the store is registered. As a general rule, it is beneficial for a retailer to register for the

54 Dansk Retursystem – Kom godt i gang med at sælge pantbelagte drikkevarer (Get started selling ready-made drinks). 2017 [report]

55 Dansk Retursystem – Årsrapporter og nøgletal (Annual reports and key figures) [website]

56 Statutory Order 2017 – Statutory Order on Deposits on and the Collection etc. of Packaging for Certain Beverages. 2017 [order]

scheme if it takes back 60–65 empty bottles per day. The remuneration allocated to the retailer for each bottle or can depend on the collection type, material and size of the container[57]. The more manual work required to handle the returns, the greater the handling remuneration. A shop can only be paid handling remuneration if it meets the sorting requirements and/or the requirements for getting equipment ready for collection. These requirements include sorting refillable packaging and preparing for collection of one-way packaging using the collection equipment of Dansk Retursystem.

The payments may be temporarily suspended if too many mistakes in sorting and preparation are recorded. Consultants working for Dansk Retursystem carry out unannounced spot checks to ensure that the requirements are being fulfilled. Handling remuneration rates shall be revised every four years and submitted for approval to the Danish EPA. Deposit refunds are paid to retailers after the empty packaging has been counted at one of Dansk Retursystem's two factories. Packaging that has been returned via RVMs does not require counting as it is registered in the machine and information is sent to Dansk Retursystem electronically.

Packaging subject to deposit is collected via RVMs and, in small outlets, manually. RVMs are the main option for returning packaging. These are generally placed by the entrance of the store, but can also be placed elsewhere on the premises, and are built into the wall. The cans and bottles are laid one by one on a conveyor belt in a slot in the machine that takes the packaging through to the sorting area on the other side while at the same time scanning the packaging: the RVM recognises the packaging based on the shape and the barcode. Full crates of refillables can be placed through a different slot.

Retailers are responsible for purchasing the RVMs themselves. The background equipment of it such as compactors can be loaned or leased to the retailers by Dansk Retursystem. The cost for compactors is in the range of 500-1,000 DKK [67-134 EUR][58]. In 2017, 3,170 stores throughout Denmark had RVM, where consumers return all deposit-marked bottles and cans.

Retailers may voluntarily take back one-way bottles and cans that consumers have purchased outside Denmark[59]. Dansk Retursystem will collect them together with the one-way packaging with the Danish deposit mark, but does not refund the deposits for these items.

Consumers

Most commonly consumers can return their empty containers in stores where they are collected manually or via RVMs (95% of collection is done through RVMs).

Figure 1: Pantstation

In addition, consumers can use a deposit return bank called "Pantstation" – a building designed for the sole purpose of taking back empty bottles and cans in order to recycle them. Consumers can deliver a bag of up to 90 bottles or cans subject to deposit (max 15 kg) at a time. Both refillable and one-way containers, as well as bottles and cans purchased abroad may be included in the bag. For the deposit to be returned, counting machines should be able to determine the deposit mark, barcode or the package form. If it is not possible to do so, the package would be recycled but no deposit would be refunded. The special deposit bag can be purchased at the Pantstation for 6 DKK [0.8 EUR]. This amount is refunded to the consumer together with the amount of deposit directly in the

57 Dansk Retursystem – Hvad får man i håndterings-godtgørelse (What do you get in handling allowance) [image]

58 Environmental Protection Agency – Market consultations regarding the operation of a deposit return system in Denmark held by the Danish Environmental Protection. Ministry of Environment and Food of Denmark. 2017 [report] and

Supermarked – Brug teknisk udstyr (Use technical equipment) [website]

59 This is expected to change in 2018 with regards to beverage containers purchased in Germany

consumer's bank account within 10 days. Dansk Retursystem has started developing this concept in 2012, as of today 12 cities in Denmark have a Pantstation. 97% of users are satisfied with this solution, however, Dansk Retursystem does not foresee to expand the Pantstation network in the near future[60].

Dansk Retursystem is working on developing new return solutions and in the summer of 2018 a 'Drop and Go' bulk solution with instant deposit redemption was tested.

Seeing that in 2014 alone, an estimated 166 million DKK [22.29 million EUR] in bottle deposits went unclaimed, the City of Copenhagen initiated a project of installing "deposit shelves" on public rubbish cans in 2015. The idea behind the project was to encourage consumers instead of throwing their empty bottles and cans into a general waste container, to place them in a separate shelf. Thereby making sure that the value of the empty container is not lost and that socially vulnerable groups of consumers living in the city can collect them and claim the deposit. The project thus has both environmental and social aspects[61]. The example of Copenhagen has since been followed by other cities in the country. Notably, Aarhus has installed 70 public waste bins with "deposit shelves" in 2016[62]. Additionally, the initiative was also replicated in Silkeborg, Bornholm, Esbjerg, and possibly other locations in Denmark[63].

Figure 2: Deposit shelves

Supervision

The Ministry of the Environment is the responsible authority regulating the DRS in Denmark[64]. The Danish EPA supervises that Dansk Retursystem complies with the regulations of the Statutory Order. Dansk Retursystem shall pay an annual amount to the Danish EPA to cover documented expenses for supervision, control and administration in connection with the deposit-refund system as well as for external assistance. Additionally, the Environmental Protection Act stipulates that, from 2015-2019, Dansk Retursystem must annually pay to the state treasury parts of the deposits that have not been collected, and which the company can post as revenue[65]. The amounts are conditional on an implemented border deposit scheme (Denmark/Germany).

The company is evaluated every 3 years by an auditing firm. Exclusive rights to operate the DRS are granted to a company for a 6-year period. The state can always acquire the shares in Dansk Retursystem for 10 million DKK [1.34 million EUR] [66].

The Statutory Order also foresees certain fines for individual or organisations that fail to comply with the obligations established by it. The penalty may reach to an imprisonment of up to two years.

60 Dansk Retursystem – Annual Report 2016 [report]

61 The Local dk – Copenhagen gives bottle collectors 'dignity'. 2015 [website]

62 Aarhus Kommune – Giv din pant videre og hold byen ren. (Give your mortgage and keep the city clean). 2016 [website]

63 Silkeborg Kommune – Giv din pant videre og vær med til at holde byen ren (Give your mortgage on and help keep the city clean). 2018 [website]

Bornholms Tidende – Hjælp til flaskesamlere: Gi' din pant videre (Bottle collector help: Give your mortgage). 2015 [website]

JydskeVestkysten – Esbjerg kopierer storbyens pantholdere (Esbjerg copies the city's mortgage holders). 2017 [website]

64 European Parliament, Directorate General for External Policies of the Union, Directorate B Policy Department – Briefing paper: A European Refunding Scheme for Drinks Containers. 2011 [report]

65 Consolidated Act 2017 – Consolidation Act on Environmental Protection. 2017 [act]. The payment shall amount to: DKK 26 million [3.48 million EUR] in 2015, DKK 37.1 million [4.97 million EUR] in 2016, DKK 56 million [7.51 million EUR] in 2017, DKK 60.9 million [8.17 million EUR] in 2018 and DKK 62.9 million [8.44 million EUR] in 2019.

66 Consolidated Act 2017 – Consolidation Act on Environmental Protection. 2017 [act]

RESULTS

In 2017, there were 25,100 registered types of deposit packaging on the market, and 1.2 billion bottles and cans with a deposit were returned, corresponding to a collection rate of 90%[67]. Collected material is sent for end-recycling at plants situated in the EU that are specialized in producing new food-grade packaging materials such as new bottles and cans. In 2017, this amounted to roughly 50,000 tons[68].

In terms of refillables, 102% of refillable bottles were returned in 2017. The return rate for refillable bottles was more than 100% because the sales of beverages in this type of packaging constitute a falling market share. This means that the number of bottles returned is higher than the number of bottles sold[69].

Since 2002, the market share for one-way packaging has increased from 0% to 84% in 2016[70]. Concomitantly, the market share for refillable packaging has decreased from 100% to 16%[71].

Table 3: Market share of one-way and refillable packaging and return rates[72]

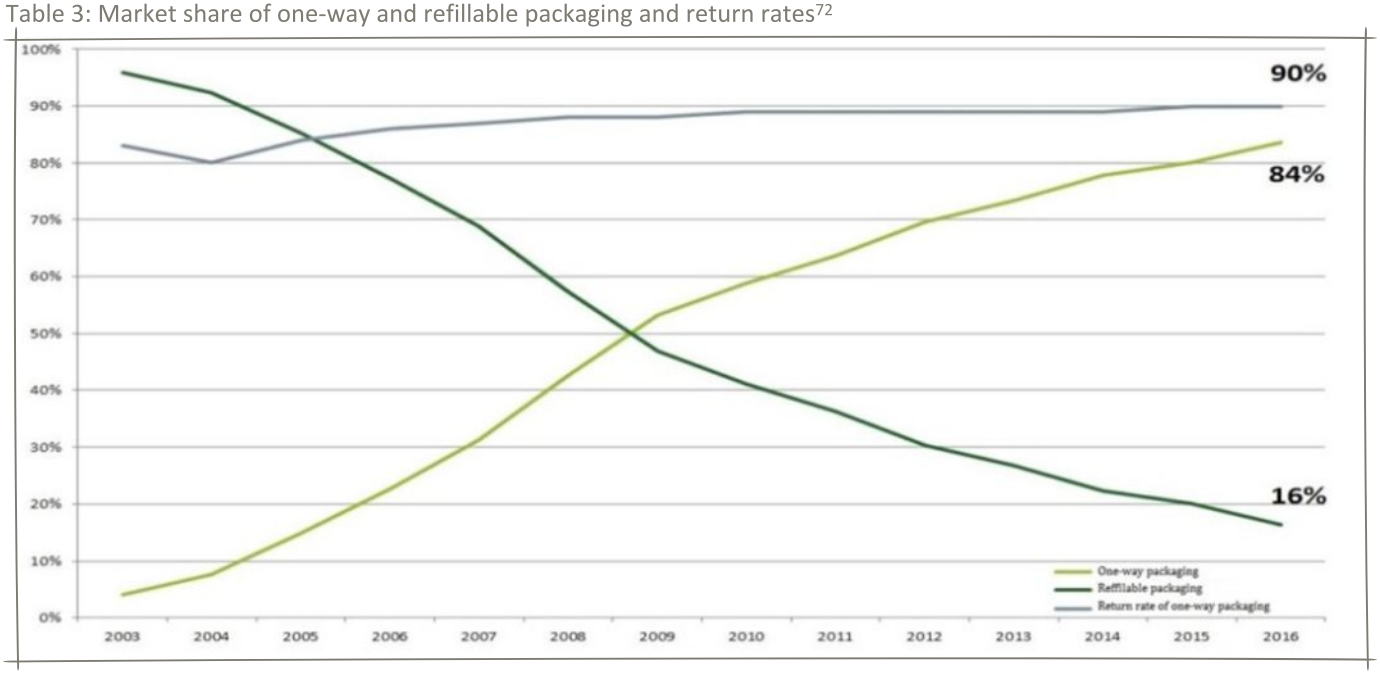


Table 4: Return rates 2011-2016 of one-way and refillable beverage packaging[73]

	2011[74]	2012[75]	2013[76]	2014[77]	2015[78]	2016[79]
One-way	89%	89%	89%	89%	90%	90%
Refillable	103%	103%	102%	103%	103%	102%

67 Consolidated Act 2017 – Consolidation Act on Environmental Protection. 2017 [act]

68 Dansk Retursystem – Årsrapporter og nøgletal (Annual reports and key figures) [website]

69 Dansk Retursystem – Annual Report 2016 [report]

70 Dansk Retursystem – Annual Report 2016 [report]

71 Dansk Retursystem – Annual Report 2016 [report]

72 Dansk Retursystem – Årsrapport 2016 (Annual Report 2016) [report]

73 Dansk Retursystem – Årsrapport 2016 (Annual Report 2016) [report]

74 Dansk Retursystem – Årsrapport 2011 (Annual Report 2011) [report]

75 Dansk Retursystem – Årsrapport 2012 (Annual Report 2012) [report]

76 Dansk Retursystem – Årsrapport 2013 (Annual Report 2013) [report]

77 Dansk Retursystem – Årsrapport 2014 (Annual Report 2014) [report]

78 Dansk Retursystem – Årsrapport 2015 (Annual Report 2015) [report]

79 Dansk Retursystem – Årsrapport 2016 (Annual Report 2016) [report]

There is no detailed survey about where the approximate 10% of bottles and cans which are not returned end up. Some end in the garbage and are combusted. This results in melted aluminium in the waste-to-energy plants. Another part ends up in nature. During the 2014 nationwide litter collection campaign, approximately 20% of the collected cans were deposit refundable cans[80]. The rest were foreign cans not part of the Danish scheme. It is estimated that 600 to 700 million cans are bought annually in Germany and brought to Denmark for personal consumption[81].

Trade in alcoholic beverages from Germany to Denmark has been causing some issues as the Danish consumers do not have an incentive to return the empty containers purchased in Germany via Dansk Retursystem[82]. To address this issue, on 22 May 2015, the Danish government secured parliamentary support for an agreement with Germany on deposits on drink cans and bottles bought in German border shops. Danish customers who buy drinks in German border shops are to pay either Danish or German deposit on bottles and cans and can get the deposit back in Denmark as well as in Germany. The deposit is imposed on the same products as in Denmark and on cans as well as glass and plastic bottles. The agreement will ensure that Danes can drop off cans and bottles in Denmark, even if they have been bought in German border shops. It is estimated that 600 to 700 million cans without deposit are purchased in the border trade with Germany each year. It is expected that Norway and Sweden will join the Danish-German agreement in the future. Before the agreement can enter into force, it requires the expansion of Dansk Retursystem to be able to handle several million additional packaging each year[83]. The Danish and the German authorities have not reached an agreement concerning the timing of establishing a cross-border deposit system[84].

No “before-and-after” one-way packaging collection rates are available since the requirement for Danish producers to market beer and carbonated soft drinks only in refillable bottles was lifted in 2002, at the same time as the DRS was established for one-way packaging.

On the basis of the Dansk Retursystem strategy for 2020, the company has worked consistently to create more dialogue with the stakeholders. According to surveys, as many as 92% of consumers are in favour of the system[85].

80 Inge Frisker – Welcome Dansk Retursystem A/S . n.d. [presentation]

81 Søren Stenderup Jensen – Agreement on deposits on drink cans and bottles bought in German border shops. International Law Office. 2015 [website]

82 European Parliament, Directorate General for External Policies of the Union, Directorate B Policy Department – Briefing paper: A European Refunding Scheme for Drinks Containers. 2011 [report]

83 Søren Stenderup Jensen – Agreement on deposits on drink cans and bottles bought in German border shops. International Law Office. 2015 [website]

84 Dansk Retursystem – Annual Report 2016 [report]

85 Dansk Retursystem – Annual Report 2016 [report]

THE CASE OF ESTONIA

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

In Estonia, the DRS came into effect on 1 May 2005. Until then, and since 1997 the Package Excise Duty Act[86] was in force, imposing a duty on packaging of goods placed on the market in Estonia. In the beginning, the duty only applied to alcohol beverage containers, e.g. beer bottles, and was later expanded to also cover other type of packaging. The underlining principle was that the packaging recovery targets were set in the Packaging Excise Duty Act, which, if not reached, results in a certain amount of duty to be paid by the producers. However, as the legislation did not foresee an authority responsible for monitoring of the system and solely required packaging undertakings to report their collection rates, the system lacked transparency. In addition to this, because the legislation did not lay down clear regulations as to who is responsible for collecting packaging, the system was unstable and differed widely across the country. This meant that the network of collection points was not well established, nor made accessible to the consumers. The collection points were mainly concentrated in towns and not in rural areas. Lastly, since a uniform deposit had not been established by the Government, the price was determined by the market and thus fluctuated between 25% and 50% of the excise rates[87].

Several factors contributed to the decision to introduce the DRS in 2005. First of all, the fact that it was difficult to monitor the market-driven system that resulted from the Package Excise Duty Act playing a strong role. Additionally, there was a de facto DRS for refillable bottles that was operational in the country until the beginning of the 1990s and there was still strong and positive memory of this experience among the general population. Lastly, the rapidly changing consumer behaviour also played a part since it was becoming more consuming-oriented rather than environmentally-friendly. On the one hand, the decision to introduce the system did not come without hesitation, as the Ministry of Environment understood the legal and technical challenges of the system. Additionally, it faced opposition from many market forces. To the extent that it hesitated to introduce the system until after the European Court of Justice presented its decision on the German deposit-return case (Case C-309/02). On the other hand, the positive aspects of the DRS, such as the examples of recovery rate of up to 90% from other countries and the possibility to keep refillables on the market and thereby avoid packaging waste was also considered by the Ministry of Environment. Furthermore, the general feeling of the

86 Packaging Excise Duty Act 1996 [website]. Like all tax-related laws, the Act is governed by the Ministry of Finance who consults with the Ministry of Environment for issues concerning the recovery/ recycling targets.

87 Schlegelmilch K. (ed.) – Green Budget Reform in Europe. Springer-Verlag Berlin Heidelberg 1999. p. 221-222 [website]

society, that expected the old system to be restored in order to receive the monetary value of the packaging, was strong and evident[88].

The Legal basis, scope, and targets. Links to other policies or instruments

The main requirements for packaging waste are established in two acts: the 2004 Packaging Act and the 1996 Packaging Excise Duty Act[89]. The Packaging Act sets up a DRS for beverage containers, implemented on 1 May 2005. A deposit is established for both reusable (glass and plastic) and non-reusable (plastic, metal, and glass) beverage containers containing soft drinks, no- and low-alcoholic beverages, beer, cider and perry, of a volume between 0.1 and 3 l:

- For the reusable packaging, the retailer is responsible for collecting the packaging and returning it to the packaging company.
- For the one-way packaging, the retailer is responsible for collecting the empty containers and handing them to recovery organisations which are responsible for organising the collection and recovery of the packaging waste. A recovery organisation is a legal entity whose founders, members or shareholders are packaging undertakings.

The legislation foresees that the deposit rate cannot be less than 0.03 EUR per package. The amount of the deposit is set by the Ministry of Environment, upon consultation with the relevant stakeholders and may be amended every 12 months[90]. The deposit rate for both refillable and non-refillable packaging is set at 0.10 EUR, regardless of the material and size, as of 1 February 2015[91].

The main objectives of the implementation of the DRS are threefold. First of all, it aims at improving the packaging collection rate, recycling and increase reuse of packaging materials. Second, it intends to increase the amounts of recyclable waste materials subjected to the regulation: plastic, glass, and metal. Third, it aims to minimise the impact of packaged goods on cities and the natural environment in form of litter and marine litter[92].

The Packaging Act foresees that a waste recovery rate shall be calculated as a ratio of packaging waste recovered in a calendar year and the mass of packaging of goods put on the market in the same period of time, expressed in percentage by weight. Failure to meet these targets may cause the materials to become subject to a packaging excise. Initial targets set in 2004 were amended and increased in 2008. As of 1 January 2009, at least 60% of the total mass of packaging waste in a calendar year shall be recovered and 55-80% should be recycled. For separate materials the targets are the following[93]:

Table 1: Targets for packaging waste

Material	Glass	Metal	Plastic
Targets	70% recycling	60% recycling	55% recovery, 45% recycling, 22.5% reprocessing into plastic

88 Eek P – Deposit on drink packages in Estonia [website]

89 OECD Publishing – OECD Environmental Performance Reviews: Estonia 2017. p. 138 [website]

90 Act 2014 – The Packaging Act [website]

91 Eesti Pandipakend – How does the deposit system work? [website]

92 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 5 [report], and Eesti Pandipakend – Deposit System Estonia: an environmental measure. 2017 [website]

93 Act 2014 – The Packaging Act [website]

Higher targets (85%) apply for PET and glass packages which are part of the DRS since such a system is more efficient in terms of collection. Regarding metal packaging, 40% target was set historically, as of 2010 it is 50%. The target for cans is set at a lower level than that for PET and glass bottles, due to the large share of metal cans being exported to Finland for personal use. In general, higher targets for the packaging subject to deposit are meant to incentivise the DRS operator to be effective and to avoid a situation where it would be in favour of increasing the share of unredeemed deposits which are an effective income. In case the recovery targets are not met, the DRS operator pays excise duty on behalf of the packaging producers.

The central piece of legislation governing waste management is Estonia's Waste Act of 2004. The Act specifies obligations for the main actors involved in waste management, establishes procedures for waste permits and includes provisions for fines and other penalties. It also establishes EPR for specific waste streams and provides a legal framework for the establishment of PROs.

In Estonia, waste management is the responsibility of the local governments that organise municipal waste collection and set up separation facilities. In general, the main targets of waste management policies are to increase separate collection of glass, metal, plastic and paper waste as well as facilitate separate collection of bio-waste and reduce landfilling of biodegradable waste. The collection systems vary in different geographical locations depending on the population and the population density, but the most common way of collecting different types of waste includes bring points near residential areas, while door-to-door collection is preferred for private housing estates/neighbourhoods[94].

Packaging waste falls under EPR and there are four producer responsibility organisations (PROs) licensed by the Ministry of environment: one deals with deposit and recycling of one-way packaging (Eesti Pandipakend) and the other three focus on general packaging (OÜ TVO, Eesti Taaskasutusorganisatsioon and Eesti Pakendiringlus). Companies that do not join one of these PROs must pay a charge for their packaging, as do PRO members when packaging targets are not met[95].

System functioning, roles and responsibilities of main stakeholders

Deposit operator

EESTI PANDIPAKEND

Eesti Pandipakend (EPP) was established in 2005 in order to organise the activities related to the DRS and the recycling of one-way beverage packaging subject to deposit in Estonia. As the DRS operator, it takes up the following obligations on behalf of packaging companies:

- Collection of packaging in the Republic of Estonia and (organisation of) recovery of the collected packaging in line with the requirements of applicable legislation;
- Acceptance of returned packaging from retailers (EPP collects the packaging from the retailer themselves upon the retailers ordering this service);
- Performance of the Packaging Company's obligations under the Packaging Excise Duty Act, including payment on behalf of the Packaging Company of excise duty on the packaging and pursuant to the procedure provided by applicable law[96].

94 European Commission – National Factsheet on separate collection: Estonia. 2014 [website]

95 Act 2014 – The Packaging Act [website] and OECD Publishing – OECD Environmental Performance Reviews: Estonia 2017. p. 150 [website]

96 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 5 [report]

EPP is a state-accredited organisation, founded by and comprised of packaging companies that pay a deposit for every item of packaging put on the market. EPP is a non-for-profit organisation which finances its activities by unredeemed deposit, sold materials and an industry fee. The latter is charged from the producers if the first two means of financing are not enough to cover the company's costs. Additionally, it organises the registration of information about packages used by packaging companies via an online tool. To facilitate the collection of the deposit-subjected packaging, it has established a barcode system which must be used by the packaging producers. In case the recovery targets set by the Ministry of Environment are not met, the DRS operator pays the excise duty on behalf of the packaging producers. To compensate the incurred costs, it would then increase the fee for producers who put on the market packaging from the material of which recovery rates were not high enough. The total revenue in 2017 reached 33.75 million EUR.

Table 2: Eesti Pandipakend income in 2017[97]

Income type	2017 (in EUR)
Deposit Money	29,254,533
Revenue from sold material	3,192,201
Collected operating fees	1,257,579
Other	54,347
Total income	33,758,660

Producers

Producers are obliged to collect and recover packaging of packaged goods placed on the market and the packaging waste that results from it in such a way that the recovery targets set by the Ministry of Environment are reached. The packaging undertakings may transfer these obligations set in the Packaging Act to a recovery organisation on the basis of a written agreement[98]. To fulfil the obligations related to the packaging subject to deposit, these may be transferred to the licensed DRS operator Eesti Pandipakend. Companies that do not join EPP must pay a charge for their packaging, as do PRO members when packaging targets are not met[99]. Packaging producers are also obliged to equip the packaging subject to deposit with a deposit marking and with a barcode.

Additionally, upon joining EPP, producers pay a one-time membership fee (100 EUR + VAT) and a one-time registration fee for each packaging placed on the market (52 EUR + VAT). In case a second test of the packaging is necessary the packaging registration fee is increased (104 EUR + VAT). Based on the monthly sales report, the producer pays 0.10 EUR for each packaging unit released on the market as well as a handling fee based on the material and type of the packaging.

Regarding refillable containers, packaging producers themselves are responsible for collecting such packaging from the collection points.

97 Eesti Pandipakend – Yearly report 2017 [website]

98 Act 2014 - The Packaging Act [website]

99 Act 2014 - The Packaging Act [website] and OECD Publishing – OECD Environmental Performance Reviews: Estonia 2017. p. 150 [website]

Retailers

Retailers sell packaged goods to the consumers and are obliged to collect the returned deposit-subjected packaging and refund the deposit to the consumers. Thus retailers are responsible for developing the network of packaging collection infrastructure, either at the place of sale or at its close proximity, and for its initial financing. Some of the costs incurred by retailers are reimbursed over time through retailer handling fees paid by the DRS organisation per each collected package. The handing fees depend on the manner of collection, manual or via RVMs, as well as the type of packaging: plastic, metal, or glass.

The reception of deposit-subjected packaging and the refunding of deposits must be organised in a manner that is convenient and accessible for the consumers[100]. The collected one-way packaging (representing 86% share of total volume) is handed over to EPP. The refillable packaging (representing 14% share) is directly collected from the packaging companies dealing with refillables (basically 3 major producers).

As of 2017, there were a total of 850 collection points, of which 670 RVMs[101].

Consumers

Consumers can return deposit-subject packaging, marked with EPP label, everywhere where those are sold or to a collection point situated nearby. Packaging without the EPP marking are not accepted for return and are not refunded with a deposit. As a rule, the collection stations and RVM in stores do not give out money but issue a receipt instead. Consumers can use the receipt to redeem their money at the cashier desk, or use the amount as a discount on their bill.

Supervision

The Ministry of Environment controls the national Packaging registry, regulates the work of the PROs and grants licences for their operation. Furthermore, upon consultation with producers (represented by the DRS operator) and other stakeholders, it sets the amount of the deposit for the packages subject to DRS. Additionally, it sets the requirements for deposit markings, such as size, as well as approves the deposit marking that is developed by the DRS operator and is thus its intellectual property through a Ministry decree.

The Packaging Act also creates the Packaging Committee – an advisory body intended to keep the system running smoothly and on target with its goals[102]. The Packaging Committee shall be formed by the minister responsible for the area and comprise representatives of relevant ministries, local governments, the Environmental Inspectorate, the Consumer Protection Board, the Veterinary and Food Board, the Competition Authority, the Tax and Customs Board, packaging undertakings, environmental organisations and professional associations of waste handlers, and experts in the area. The function of the Packaging Committee is to coordinate the achievement of the goals arising from the Packaging Act and to act as an advisory body to the minister responsible for the area in developing the packaging and packaging waste policy and accreditation and repeal of accreditation of recovery organisations. In order to fulfil its functions, the Packaging Committee requests, where necessary, information from a recovery organisation, reviews a recovery organisation's written report on the activities in the previous calendar year, and submits its opinion to the minister responsible for the area on the compliance of the activities of a recovery organisation with the conditions of accreditation[103]. After 2006-2007, the Packaging Committee deals mainly with the evaluations of yearly reports of all PROs foreseen under the Packaging

100 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 5 [report]

101 Eesti Pandipakend – Deposit System Estonia: an environmental measure, 2017 [website]

102 The section is based on the information provided in the Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 7 [report] and Bottle Bill Resource Guide: Estonia [website]

103 Act 2014 - The Packaging Act [website]

Act. All PROs have to present their activity report, describing in detail their activities, changes on customers and economic activities, service providers, agreements with the Municipalities for container collections systems and collection network, spending on public relations, and actual work done. As an advisory body to the Minister, the Committee should deal also with the cases, where there is evidence that a PRO does not fulfil the requirements set by PackAct. If the case is serious and lasting, then the Committee can make a proposal to revoke activity license.

RESULTS

Over 10 years of operation, the DRS results in continuously reaching and overpassing the set targets. The percentage of deposited packaging sent for recovery in 2017 was: 87.8% of plastic bottles, 88.7% of glass bottles, and 73.5% of cans by total weight put on the market. All collected cans (mainly aluminium) are sold to recyclers in other EU countries (England and France), where they are melted and sold back to the beverage industry meaning a closed loop for cans. The European aluminium can market prices fluctuate between 1,000 – 1,400 EUR per tonne. Collected plastic bottles (mainly PET) are auctioned for recyclers in Estonia or abroad at a price ranging between 175 – 450 EUR per tonne. Part of recycled PET bottles is used in food industry for new food packaging, and part is turned into fibre and goes to the textile industry. Clear glass bottles are recycled in Estonia and turned into new bottles and jars. Coloured glass is sold to recyclers abroad, as there is no coloured glass melting factory in Estonia.

Table 3: Packaging collection rates

One-way package	Actual		Requirement by law	
	2016	2017	2015	2016
Sales, million units	311.25	291.26		
Return, million units	244.96	231.33		
PET return rate	87.4%	87.8%	85%	85%
CAN return rate	74.0%	73.5%	50%	50%
OWG (one-way glass) return rate	86.8%	88.7%	85%	85%

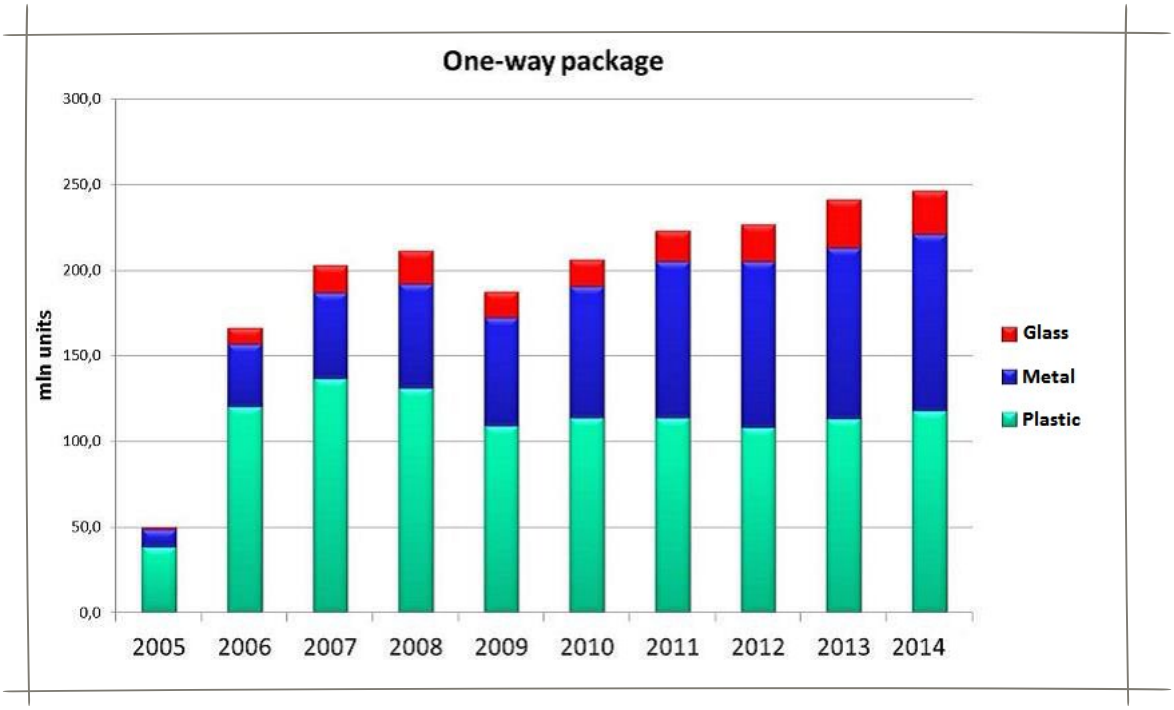


Figure 1: Collected packaging between 2005 and 2014[104]

104 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 10 [report]

Despite the fact that the Ministry of Environment did not conduct a quantitative study on littering before and after the DRS was introduced, reduced litter has been observed in the city surroundings and nature areas in link with the high return rates[105].

In Estonia, both DRS and container-based collections systems were rolled out at the same time in 2005. This was different to many other countries where the container collection system with one or several organisations of the “green dot” type have been in operation before the DRS was introduced, and as a consequence, they became big opponents of the DRS. As the two systems were introduced at the same time, this was not the case in Estonia. However, the effects of one system on the other have not been measured, yet.

Regarding the perception of the population, 95% of consumers are aware of the deposit system, 81% think that it is important to return containers and 65% regularly returns packaging to a collection point/retailer. This indicates that the system gives a clear message and motivation for the consumers to participate[106].

In the latest survey of producers and retailers conducted by the DRS operator EPP, both retailers and producers, noted that the DRS system is needed in order to protect the environment. Producers’ average was 4.2 points and retailers 4.5 points (on a scale from 1 to 5, in which 5 is the most positive.

A modification to the system was announced by the DRS operator on 1 January 2017. EPP noted that it will only accept bottles and cans marked with special barcodes and deposit stamps proving that the containers and their contents were not sold outside of Estonia. This special regulation because of Latvian boarder trade applies only to alcoholic PET bottles and cans, i.e. if a producer is putting alcoholic beverages in PET bottles or cans on the Estonian market, they have to be marked with an Estonian-based EAN code and cannot be sold in Latvia and other neighbouring countries. The head of waste disposal at the Ministry of Environment explained that the move was prompted by a "sharp rise" in drink imports from Latvia, where customers pay far less in alcohol duties. The Estonian system had hitherto been very open: if a customer bought something in Latvia and returned the packaging in Estonia, since the stamp was the same, he would receive the deposit[107].

105 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 10 [report]

106 Regions for Recycling (R4R) Project – Good Practices Factsheet 1: System of deposit packaging. p. 10 [report]

107 BBC News - Estonia clamps down on cheap drink imports. 2017 [website]

THE CASE OF FINLAND

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

Finland had a long history of returning refillable glass containers dating back to the 1950's. The first system concerned refillable glass bottles and was operated by the breweries with their own pool of bottles. In 1994 the government introduced a packaging tax affecting soft and alcoholic beverages with the objective to further incentivise producers and importers to participate in a DRS. The tax was 4 times higher for one-way packaging outside of a deposit system and was not applicable to refillable containers which were part of a deposit system. Therefore, there were clear incentives to join a deposit system both for refillable and for one-way beverage containers.

In order to alleviate the producers from the burden of the packaging tax, a DRS for one-way beverage cans managed by a centralised organisation was created in 1996, on initiative of the beverage producers and the retailers. In 2004, a new DRS operator was set up to manage refillable PET and glass bottles. The refillable glass bottles have been previously handled by the Finish alcohol monopoly before it was decided to integrate them in the DRS system. In 2008, following a change in the packaging tax, the one-way deposit system was extended to PET bottles and in 2011, to one-way glass bottles[108].

LEGAL BASIS, SCOPE, TARGETS. LINKS TO OTHER POLICIES OR INSTRUMENTS

A legislation introducing a packaging tax based on volume (litres) has been in place since 1994[109]. It applies to packages for alcoholic beverages, soft drinks, and bottled water[110]. The taxation system aims to encourage the reuse and recycling of drinking packages, to reduce the quantities of such materials ending up in landfills and to prevent littering. Containers that belong to a functional deposit-based return system and can be refilled or recycled as raw material are exempt from the tax. One-way packaging which is part of a DRS has been subject to a zero-rate tax since 2008. Refillable containers that are part of a deposit system have been entirely exempt from the tax from the beginning. Some see this as the main reason for the switch from refillable to one-way containers in Finland over the last decade.

108 Information mainly coming from direct contact with PALPA, IEEP (2017) – Deposit Refund System (and Packaging Tax) in Finland [report] and PALPA (2017) – Case study on Finnish deposit refund system (Presentation during final conference on capacity building for environmental tax reform held on 5 October 2017 in Brussels) [website]. Other sources of information are explicitly mentioned.

109 Act 1037/2004 – Laki eräiden juomapakkausten valmisteverosta (Act on excise duty on certain beverage packaging) [website]

110 All packaging falling under customs tariff group CN22 [website]

Table 1 : Tax amounts per type of soft and alcoholic drinks packaging

Packaging tax/ l	1994	2005	2008
One-way packaging part of a DRS	0.17 EUR/l	0.085 EUR/l	0 EUR/l
Refillable packaging part of a DRS	0 EUR/l		
All packaging not part of a DRS	0.67 EUR/l	0.51 EUR/l	

The framework for the DRS is laid in a related decree on collection systems for returnable drinks packaging[111]. The decree sets the minimum deposit values for different types of packaging. In accordance with the provisions of the decree, the current deposit values applied by the deposit system operator PALPA are the following:

Table 2: Deposit values for different packaging types

Type of container	Beverage cans	Plastic bottles			Glass bottles
		< 0.35 l	0.35 – 1 l	> 1 l	
Deposit values[112]	0.15 EUR	0.10 EUR	0.20 EUR	0.40 EUR	0.10 EUR

The minimum reuse and recycling targets are 90% for all types of packaging part of a deposit system. If the targets are not reached, the deposit operator has to submit to the Finnish governmental agency of the department of environment[113] an action plan with additional measures on how to achieve the targets.

Until 2015, Finland had a partial producer responsibility for packaging, meaning that it only covered industrial plastic packaging waste[114] since municipalities had the obligation for organising the take-back of consumer packaging[115]. Since 1 May 2015, the producer responsibility organisation RINKI[116] takes care of the collection, transport and treatment of household packaging waste[117]. RINKI is a non-profit service company owned by Finnish producers and retail trade[118]. It operates the eco take-back point network for the collection of glass, metal, carton, and plastic packaging[119]. In 2016 it reached 78% of glass, 84% of metal and 24% of plastic recycling rates[120].

System functioning, roles and responsibilities of main stakeholders

Deposit operator

The deposit operator for one-way packaging in the country is Suomen Palautuspakkaus Oy (PALPA). It

111 Decree 180/2005 - Valtioneuvoston asetus eräiden juomapakkausten palautusjärjestelmistä (Government Decree on the return systems for beverage containers) [website]

112 Norden – The Use of Economic Instruments In Nordic Environmental Policy 2010–2013. Nordic Council of Ministers 2014 [report]; PALPA (2018) – Price lists [website]

113 Pirkanmaan ympäristökeskus (Pirkanmaa Regional Environment Centre)

114 Norden – Economic Policy Instruments for Plastic Waste – A review with Nordic Perspectives. Nordic Council of Ministers 2014, p. 39 [report]

115 EXPRA – Finland [website]

116 Finnish Packaging Recycling RINKI Ltd [website]

117 Norden — Economic Policy Instruments for Plastic Waste – A review with Nordic Perspectives. Nordic Council of Ministers 2014 [report]

118 Finnish Packaging Recycling RINKI Ltd [website]

119 RINKI – Check the packaging sorting instructions for households [website]; Household packaging waste to Rinki eco take-back points [website]

120 RINKI – Rinki collects packaging statistics from more than 4,000 companies [website]

was created in 1996 to operate the system for one-way beverage cans. In 2008 PALPA extended the system to one-way PET bottles, and in 2011 – to one-way glass bottles.

PALPA is a non-for-profit organisation owned by retailers (50%) and beverage producers (50%). Membership is open to every company falling under the deposit regulation. Decisions on the amount of different fees of the system – deposit, membership, recycling, product registration and handling fees – are decided by PALPA's Board of Directors. PALPA's strategy is to run the system as an administrative office – it outsources all activities related to collection and treatment of containers to a network of companies and does not own any operational assets. PALPA itself has a staff of 13 employees and this way of operation allows for great flexibility. It is financed though registration and recycling fees from retailers and breweries, unredeemed deposits, and sale of collected material (aluminium, PET-plastic, and glass). Since return rates are very high, revenues come mainly from material sales and recycling fees. The average distribution between the different revenue streams varies significantly over time, because the value of the different materials is not the same. For example, PALPA can set the recycling fee of cans at a very low level due to the relatively high revenue received from aluminium sales; while the market value of glass is rather low, and consequently the recycling fee for glass has to be set higher.

The revenues are used to cover the operational costs related to processing of returned packages and to pay compensation to parties performing the different operational activities. All fees applied are based on real costs of handling the materials and can be adjusted to market conditions in order to cover the necessary costs (except for the deposit fees which should better be kept constant throughout the years – notably because of practicality considerations such as labelling). The registration fees reflect the costs charged by RVM manufacturers for running of the machines and administration of the databases. The different recycling systems (for aluminium, PET and glass) have separate accounting and their own pricing, and no cross-financing between them is allowed.

Table 3: Fees for producers (2018)[121]

Type of container	Aluminium cans	Plastic bottles	Glass bottles
Recycling fee	0.005 EUR	0.017 – 0.116 EUR	0.09 – 0.14 EUR[122]
Product registration fee	284.55 EUR		325.20 EUR[123]
Company registration fee	6,178.88 EUR (or 1,382.11 EUR x 5 if paid over the 5 year period)		3,658.55 (or 813.01 x 5 if paid over the 5 year period)

A beverage metal or glass container, whether or not subject to a deposit, becomes PALPA's property once it has been registered as received by a Reverse Vending Machine or the retailer has placed it in PALPA's transport package[124]. In the case of cans, the value of the material more or less compensates the logistic cost; in the case of glass, it represents a net cost. Non-deposit PET bottles are not accepted because plastic recycling is more delicate and PALPA uses only the packages that are recognised and that belong to the system.

Because of the low population density in Finland, cost of transportation is a significant expense. To face this challenge, baling and counting operations have been decentralised to several locations and material is compacted and sorted as early as possible after collection to increase cost efficiency (where possible, at collection point itself, via RVM). PALPA pays a transport fee to transporters that collect the beverage

121 PALPA (2018) – Price lists. Fees depend on the volume for glass and on the volume and type of material for PET (clear, coloured, mixed); fees excluding VAT

122 This fee applied to a retail product. For the hotel, restaurant and café sector lower fees apply ranging between 0.13 (for ≤ 0.5 l) and 0.22 (for > 0.5)

123 This fee applied to a retail product. For the hotel, restaurant and café sector the prise is set at 40.65 EUR

124 PALPA (2016) – The rules of the deposit-refund system for Beverage Can. [report]

containers from retailers and deliver them to a bailing and counting plant. From there, the materials are delivered to material recyclers who pay PALPA for the recycled material.

The system is based on package recognition. This means that when a customer puts a container inside a RVM, it scans its barcode and shape, and compares the data with the packages registered in the database. Thus, as part of the registration, PALPA inspects all new packages in order to make sure that the materials comply with the specifications agreed with recycling plants and the marking is clear and recognisable by all RVM.

There is an additional deposit operator which is managing the system for refillable beverage containers as well as reusable transportation units of retailers. It has been created by the beverage producers in 2004 under the name of Ekopulloyhdistys ry (Ekopullo). It also runs on a non-for-profit basis and operates within PALPA – meaning that it does not have own employees, but buys services from PALPA. As a result, there is no antagonism or competition between the two operators. On the contrary, there are synergies since Ekopullo administrates all the transport packaging – which is used not only for refillables (pallets, cases, trolleys), but also for one-way beverage packaging.

Producers

Importers and producers have to pay a packaging tax of 0.51 EUR/l for packages in customs tariff group CN 22. They are allowed to a tax exemption if the company and the products are registered in a deposit recycling system.

For one-way packaging, companies can join PALPA against a membership fee. In addition, a registration fee is due for each product added in the return system, and deposit and recycling fees are charged on the basis of the packages released on the market.

When joining the system for the first time, companies fill in a product registration application and send models of packages to PALPA and the machine vendors for approval. The packages are tested to ensure that all the machine models of all vendors are able to handle the deposit packages returned by consumers without any problems. The package must also feature a deposit marking and a barcode which is read by the machines. For cans and PET bottles, the deposit marking is obligatory, while for imported one-way glass bottles deposit only the barcode can be accepted (the recycling fee due in this case is a little bit higher).

For refillable glass bottles, companies can become a member of Ekopullo. The system is operating only within Finland and there are no imports of refillables. In the Ekopullo system, each member owns the bottles, and the transportation units (pallets) they need. Ekopullo administrates and optimises the pool of packages, maintaining sufficient number of packages and defining the need of replacement, stock and new purchases for the members.

Retailers and shops[125]

Any retail point selling beverage containers subject to a deposit is obliged to take back the empty packaging. The only exception mentioned in the law is the volume in relation to sales, meaning that a retailer of small size can refuse to accept packaging if the volume is disproportionately high in relation to its size. However, this issue has not occurred in practice.

Retailers are responsible for the acquisition and maintenance of RVM, as well as for ensuring that the RVM have working electronic connection allowing for the information of the returned containers to be transferred to PALPA. In 2016, around 4,000 RVM have been in operation with 5,000 retail collections for

125 PALPA (2016) – The rules of the deposit-refund system for Beverage Can. [report]

consumers and additional 9,000 collection locations in the out of home consumption places (hotels, restaurants, cafes) sectors. When returning beverage containers subject to a deposit, the retailers are entitled to receive a handling fee and deposit fee refunds for the containers received from consumers. The fees are paid out on the basis of the data received by PALPA through the automated RVMs or of the calculation data of manual bags.

Consumers[126]

Consumers pay an additional deposit for the beverage packaging marked with a deposit sign. They can return and claim back the deposit at any retail point selling packaged beverages.

Supervision

DRS are approved and controlled by Environmental Authority under Ministry of Environment. Operators are authorised to manage the system and no particular period is defined. For all producer responsibility organisations (both dealing with deposit and with other packaging) there is a requirement to have a reserve in some form which is sufficient to cover the running of the system for 6 months.

126 Pantilliset – Juomapakkausten Kierrättäminen (Recycling of beverage packaging) [website]

RESULTS

PALPA has approximately 72 million EUR and 320 million EUR in deposit turnover[127]. The costs of the system consist of the costs related to the operational activities and administrative costs (the latter represents very small percentage of the total since all operations are outsourced and PALPA staff consists of 13 employees). The revenues come mainly from fees and material sales (since return rates are very high, the share of unredeemed deposits is marginal). PALPA is a non-for-profit company so the costs and revenues of the system should be equal and the net balance close to zero. If there is any surplus, it is reinvested in the system or is kept as a reserve to cover a net deficit.

The return rates reached are as follows:

Table 4: Return rates and collected volumes

Material	Beverage can	PET bottle	Glass bottles
Return rate (2017)[128]	94%	91%	87%[129]
Volume (2016)[130]	1.2 billion returns 17,600 tonnes	380 million returns 12,700 tonnes	114 million returns 51,000 tonnes

Recycling systems operated by PALPA collect around 80,000 tonnes of material (1.7 Billion package units) into new packages or raw materials for other industries. Aluminium from returned beverage cans is melted for recycling in the UK, Germany and France. PET bottles are shipped to recycling plants in Finland, Latvia and Germany: clear PET is recycled to new bottles and other food packages; coloured PET-bottles are recycled for other packaging or for the textile producers. Glass bottles are recycled in Finland to new glass bottles or to raw materials (such as insulation products in construction producers).

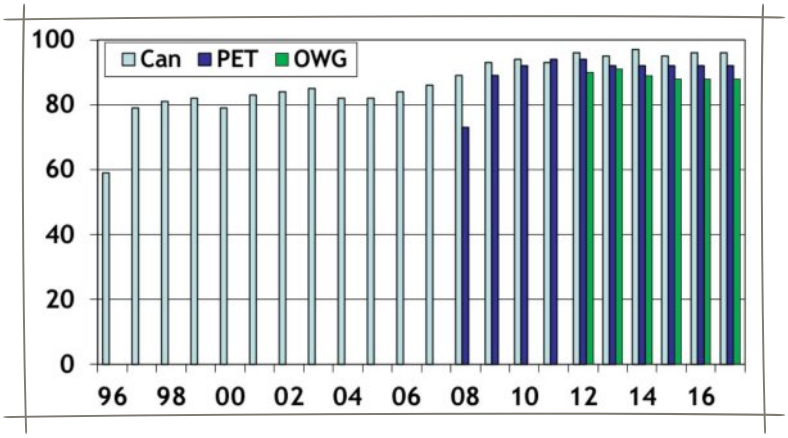


Figure 1: Returned packages per type of one-way container[131]

No specific studies have been done concerning litter, perception of stakeholders or comparisons with a container-based system. General studies indicate that Finnish consumers have a high level of environmental awareness, enhanced by a long history of recycling and taking care of the environment.

127 PALPA – What is PALPA [website]

128 PALPA – Refund rates [website]

129 If counted in units, the return rate is below 90%. However, counted in tonnes the return rate is above (taking into account international packages from imports which are not registered in the system).

130 PALPA "1.7 billion environmental acts a year", presentation by delivered by Pasi Nurminen, Managing director of PALPA

131 PALPA – Case study: Finnish deposit refund system (DRS) [document]

THE CASE OF GERMANY

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM[132]

Packaging waste had become a big political issue in Germany in the late 1980s. It came at a time when local authorities had difficulties to politically agree and to finance new landfills and new incinerators. During the same time the Federal Government intended to implement a mandatory deposit on one-way beverage containers, as well as to introduce measures to increase the share of refillables. Being faced with the prospect of a mandatory deposit system and wishing to avoid it, the industry, under the leadership of the retail sector, agreed with the government the setting up of a system for collection and treatment of household packaging waste. This system would be entirely financed and managed by the industry and would run in parallel to the waste management system run by local authorities (hence the name "dual system"). This is how the first producer responsibility organisation for packaging – Duales System Deutschland (DSD) was founded and started operations. In return, the government promised to stop their plans regarding the deposit.

However, the idea of a mandatory deposit was retained in the regulations within the German Packaging Ordinance of 1991. The Ordinance mandated a national market share of refillable drinks packaging of 72%. In the case of inferior quota a mandatory deposit would be imposed on non-refillable drinks packaging of any material in the drink categories that fall behind their 1991 level.

In 1997 the market share of refillables fell below 72% for the first time marking a start to a trend which only accentuated in the following years. This led to the introduction of a mandatory DRS as of January 2003. This decision faced very strong opposition by the industry and led to strong fights with the Ministry of Environment and politicians[133]. As a result, the initial system had some critical drawbacks (eg. number of exceptions, "island solutions" – i.e. a situation where retailers accepted only packages which they sold, in absence of a coherent clearing system). Several major changes and optimisations to the initial system took place until May 2006, when the real and nationwide DRS commenced.

132 Information in this section is coming mainly from Groth, M. – A review of the German mandatory deposit for one-way drinks packaging and drinks packaging taxes in Europe. University of Lüneburg. Working Paper Series in Economics. 87. 2008 [study]

133 Quoden, J. – Rechtsanwalt Joachim Quoden. Case study Germany. 2012 [not public]

Legal basis, scope, and targets. Links to other policies or instruments

The main piece of legislation concerning packaging, including the DRS, is the German Packaging Ordinance[134]. According to this Ordinance, the deposit of minimum 0.25 EUR including VAT has to be levied on the following one-way beverage packaging:

- Of a volume between 0.1 l and 3 l;
- Made out of materials which are considered as "non-ecologically advantageous";
- Containing specific types of drinks and explicitly including beer, water, soft drinks, and alcohol-containing drink mixes.

Not subject to the deposit are drinks in packages which are considered as "ecologically advantageous": beverage cartons, polyethylene pillow bags, and stand-up pouches. Further, the following drinks are excluded from the deposit: fruit and vegetable juices, dairy drinks (more than 50% milk content), beverages intended for child/ baby consumption, wines, and liquors. These are subject to specific food regulations. In addition, according to the Federal Ministry of Environment, they represent only a marginal fraction of the market and, therefore, do not justify the efforts required for the application of a take-back and deposit system[135].

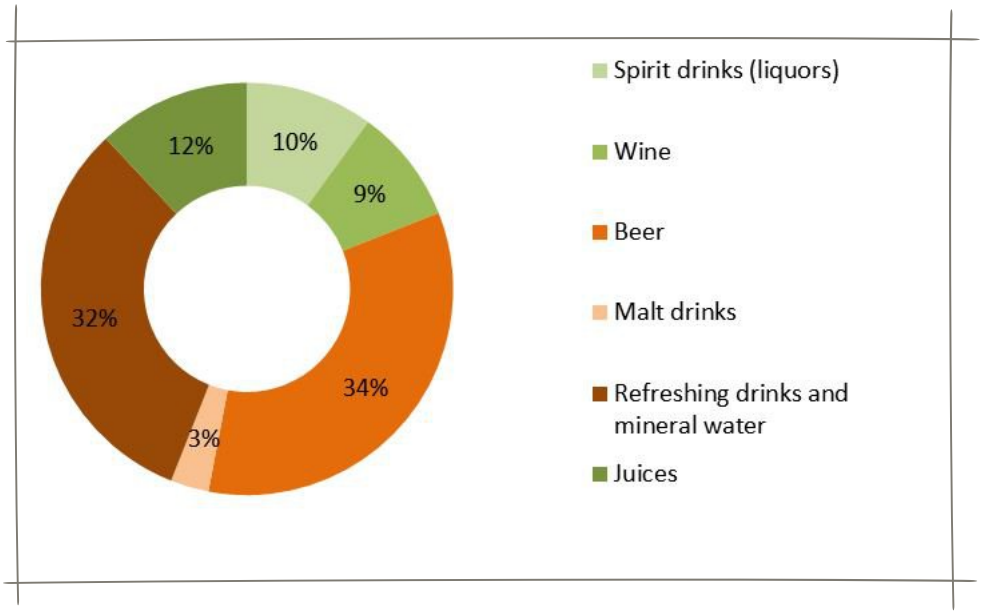


Figure 1: Market share of beverage categories (in % of turnover) in 2015[136]

One-way packages of beverages not covered under the DRS are collected through the dual system for household packaging waste. There is a separate voluntary deposit system for refillable glass and PET beverage packaging. The deposit value for the majority of refillables is 0.08 EUR or 0.15 EUR, with some exemptions for "exotic" refillable bottles.

However, the deposit for eligible one-way containers is 0.25 EUR flat for all sizes and materials[137].

134 Ordinance VerpackV – Verordnung über die Vermeidung und Verwertung von Verpackungsabfällen (Verpackungsverordnung – VerpackV) (Ordinance on the prevention and recovery of packaging waste (Packaging Ordinance – VerpackV)). 1998 [ordiance], last amendment in July 2017, §9 of the Ordinance concerns the deposit

135 BMUB – Fragen und Antworten zur Pfandpflicht. (Questions and answers about the compulsory deposit). 2014. [report]

136 WMP Consult – Zukunft der Getränkeindustrie – Entwicklung von Markt, Beschäftigung und Arbeitsbedingungen (The future of the beverage industry - development of market, employment and working conditions). 2016 [report]

137 Deutsche Umwelthilfe – Hintergrundpapier: Informationen zum umweltfreundlichen deutschen Mehrwegsystem (Background paper: Information on the environmentally friendly German reusable system). 2014 [report]

The recycling targets are contained in the Packaging Ordinance[138], which is going to be replaced by the German Packaging Law[139], coming into effect on 1 January 2019.

They are defined for each packaging material as follows (no specific targets for the DRS):

Table 1 : Recycling targets for packaging (material recycling in % of weight)

Material	Packaging Ordinance	Packaging Law 2019	From Jan. 1, 2022
Glass	75%	80%	90%
Paper & Cardboard	70%	85%	90%
Ferrous Metals	70%	80%	90%
Aluminium	60%	80%	90%
Beverage Carton Packaging	60%	75%	80%
Other Composite Packaging	60%	55%	70%
Plastic (Material Recycling)	36% (60% recovery, hereof 60% recycling >> 36% mechanical recycling)	58.5% (90% recovery, hereof 65% recycling >> 58.5% mechanical recycling)	63% (90% recovery, hereof 70% recycling >> 63% mechanical recycling)

System functioning, roles, and responsibilities of main stakeholders[140]

Deposit operator

Deutsche Pfandsystem GmbH (DPG) was established in 2005 in order to practically implement and organise the legally prescribed obligation of the DRS for one-way beverage containers in Germany. This involves, in particular, the operation of a central database for deposit clearing and the management of the marking standards related to the deposit label: DPG security mark and a barcode identification number (GTIN). However, DPG does not play the role of a central management and clearing organisation that undertakes among other tasks the settlements of the deposits for the companies involved. Instead,

138 Ordinance VerpackV – Verordnung über die Vermeidung und Verwertung von Verpackungsabfällen (Verpackungsverordnung – VerpackV) (Ordinance on the prevention and recovery of packaging waste (Packaging Ordinance – VerpackV)). 1998 [ordinance], Annex I

139 Verpakg – Information Platform for Manufacturers and Distributors Regarding the Packaging Law and Packaging Ordinance [website]

140 DPG – Die Funktionsweise des Pfandsystems (The functioning of the deposit system) [website]

it provides the participating companies a framework within they can undertake the settlements between themselves.

DPG is a non-for-profit company whose shareholders are the German Retail Federation (50%) and the Federation of German Food and Drink Industries (50%). DPG financing comes through membership fees. Every member of the DPG has to pay a small annual fee, depending on the size of its operations.

In the context of the deposit clearing process, the requirements placed by DPG on producers and retailers are extensive and require appropriate technical know-how and personnel, as well as the necessary software and hardware capacity for processing of the sometimes very large quantities of data. This is why producers and retailers can commission the technical management of the clearing processing to specialised service providers[141] (who have concluded a licensing agreement with DPG).

The unredeemed deposits stay with the producers and the retailers own the collected material, which they can sell to the recycling industry.

Producers

The producer, who decides to market drinks in one-way packaging subject to a deposit, must fulfil the following obligations:

- Charge a deposit of at least 0.25 EUR for each one-way drinks packaging
- Ensure the packaging is clearly identifiable as being subject to a compulsory deposit via specific marking/ labelling
- Take part in a nation-wide deposit scheme that allows the members of the scheme to manage the deposit return claims among themselves.

By registering with the DPG system, they can fulfil these obligations. This happens through a contract between DPG and the producer which is called “first distributor” in the DPG system. Once the contract is concluded, the producer needs to identify the packaging with a barcode and DPG-label; and enter the relevant information into the DPG database. The producer receives the deposits for its packages from retailers and keeps them in order to repay the retailers later, once the containers were taken back. A deposit account service provider, approved by the DPG, can assist in the invoicing and clearing procedure.

Retailers[142]

Each retailer who purchases drinks subject to a deposit from a “first distributor” must pay a deposit for the drinks packaging, in addition to the purchase price. When it resells the drinks, it levies a deposit from the consumer. The retailer refunds the deposit to consumers on acceptance of returned packaging. All returned packaging units are registered electronically, either through RVMs at point of collection or through industrial RVMs at central processing and counting depots.

The retailer takes back the one-way packaging and afterwards makes a deposit-refund claim to the “first distributor” based on the data recorded. The retailer can determine to which “first distributor” he must address his claim by reading the barcode of each container and comparing it to the data in the DPG system. The “first distributor” will then refund the data previously levied when selling the drinks.

141 DPG – Service Providers [website]

142 DPG – Tasks and obligations [website]

Since 2006, retailers and other final distributors of drinks concerned by compulsory deposit are obliged to take back one-way beverage packages which are subject to a deposit, but only packages of the same type of materials as those in their own range, independent if the packaging in question was sold by them or by another retailer. This means that a retailer that only sells PET one-way bottles is not obliged to take back aluminium cans or glass bottles, but is obliged to accept all PET bottles independent of their size, shape or brand.

An exception to this obligation is valid for small shops with a surface area of below 200m^2. They are allowed to only accept packaging similar to their own product offer (brand limitation).

The retailers and shops have two options about how to accept the empty packages from consumers: via RVMs or manually. In the first case, the collector purchases a DPG certified collection machine and places it in its sales rooms. Before being put into operation, the machine is entered in the DPG system database and is linked to the specific collector. When empty containers are put into the RVM, the machine checks the validity of the DPG marking and recognises the packaging on the basis of the printed article number (GTIN). For each packaging recognised as valid a so-called electronic raw data set is prepared; at the same time the packaging is destroyed (compressed) to prevent any repetition of the return procedure. The packaging is then passed to the recycling. The deposit invoice is automatically carried out on the basis of the electronic dataset.

The purchase of a RVM is not a precondition for participation in the DPG clearing process. There is also the possibility for manual collection in the shop. In this case, the electronic dataset for the deposit invoice is prepared subsequently. After the manual collection, the containers are gathered and brought to authorised counting centres (run by various operators nationwide) for automated recording. Counting centres function in principle just as the RVM: they can recognise DPG packages and prepare an electronic dataset for each packaging needed for the deposit invoice. Also in the Counting Centre deposit packages are first recorded and then compressed and passed on for recycling.

The electronic datasets are used to identify the corresponding producer via the DPG database. Data relating to the same producer are summarised in a “notice of claim” with a corresponding invoice.

Consumers

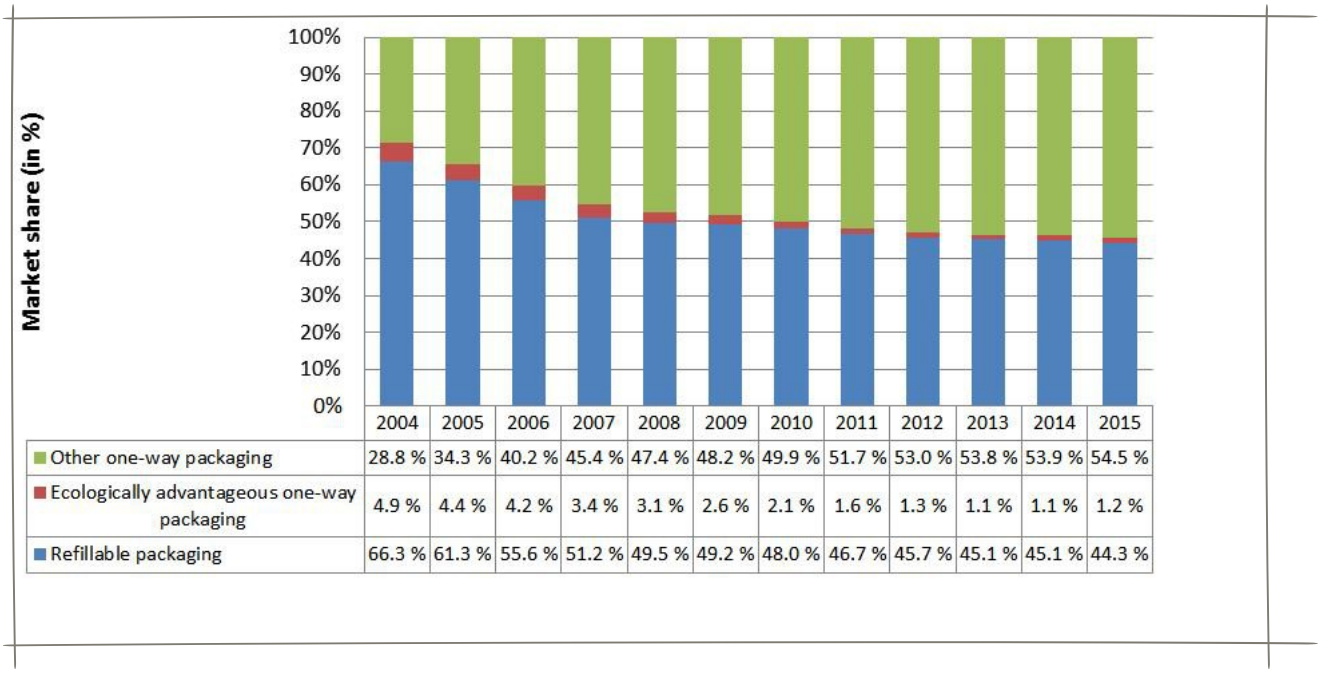
Consumers pay a deposit for every beverage in one-way packaging they buy. They can redeem the deposit when they bring it back to a retailer. They can only get a deposit back for packaging which has a DPG-deposit mark on it, thus not for packaging from abroad. There is a different deposit for refillable packaging which is part of a different system than the DPG system.

Supervision

According to the Packaging Ordinance, the Federal Government shall conduct annual surveys to determine the share of beverages filled in refillable and ecologically advantageous one-way packaging by calculating the sum of beverages sold in reusable packaging and in ecologically advantageous one-way packaging to the overall volume of beverages sold in all packaging.

With the new Packaging Law coming into effect on 1 January 2019, the Government shall continue to conduct annual surveys. Government agreed on an evaluation plan for 2020/21.

The main argument for introducing the DRS was to keep high share of refillable bottles as these are considered to be more environmentally advantageous. However, starting from levels above 70%, the share of refillables has been steadily declining since the late 1990s, while the share of one-way packaging has been on the rise.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Other one-way packaging	28.8 %	34.3 %	40.2 %	45.4 %	47.4 %	48.2 %	49.9 %	51.7 %	53.0 %	53.8 %	53.9 %	54.5 %
Ecologically advantageous one-way packaging	4.9 %	4.4 %	4.2 %	3.4 %	3.1 %	2.6 %	2.1 %	1.6 %	1.3 %	1.1 %	1.1 %	1.2 %
Refillable packaging	66.3 %	61.3 %	55.6 %	51.2 %	49.5 %	49.2 %	48.0 %	46.7 %	45.7 %	45.1 %	45.1 %	44.3 %

Figure 2: Market share of different packaging categories 2007-2015 (in %). Source: Umweltbundesamt (2017) and BMUB [143] (2017)[144]

Looking at the break-down per types of packaging (Figure 3), it appears that the major market share is held by one-way plastic bottles. The reasons for this could be traced back to the origins of the deposit-refund scheme. When the scheme was first introduced in 2003, the Packaging Ordinance did not require the operational rules for the deposit system to be established by regulation and the government gave producers (manufacturers and retailers) the possibility to introduce a nationwide clearing system until October 2003. As a result of political disagreements and legal uncertainty, this deadline was not met and a series of independent arrangements ensued. The most widespread practice was the so-called individual or "island" solutions where retailers accepted back only those packages which corresponded to their own product range. This was possible as the initial Packaging Ordinance limited the take-back obligation of retailers to empty packaging of the same type, shape, and size; and for the same products as those sold by the retailers. Thereby, retailers operating individual solutions were able to avoid taking back products from competitors and thus did not need to participate in expensive clearing systems. As cans have a generic shape, it was not possible to establish such separation and consequently retailers decided to stop selling cans altogether. The only exemption was a major energy drink producer, which ran its own state-wide clearing system. Individual solutions placed cans at a strong competitive disadvantage against PET. In particular, the discount chains largely resorted to such solutions[145]. Also currently, discounters sell beverages predominantly in one-way plastic bottles with two exemptions of discount retailers featuring refillable bottles in their range[146].

143 BUMB: Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit

144 Umweltbundesamt – Vergleich der Packmittelgruppen Getränke (Comparison of packaging groups drinks). 2017 [report] Accessed in September 2018; BMUB – Anteile der in Mehrweg-Getränkeverpackungen sowie in ökologisch vorteilhaften Einweg-Getränkeverpackungen abgefüllten Getränke (Shares of beverages bottled in reusable beverage packaging as well as in ecologically advantageous disposable beverage packaging). 2017 [website]

145 Groth, M. – A review of the German mandatory deposit for one-way drinks packaging and drinks packaging taxes in Europe. University of Lüneburg. Working Paper Series in Economics. 87. 2008 [report]

146 Mehrweg – Märkte (Market) [website]

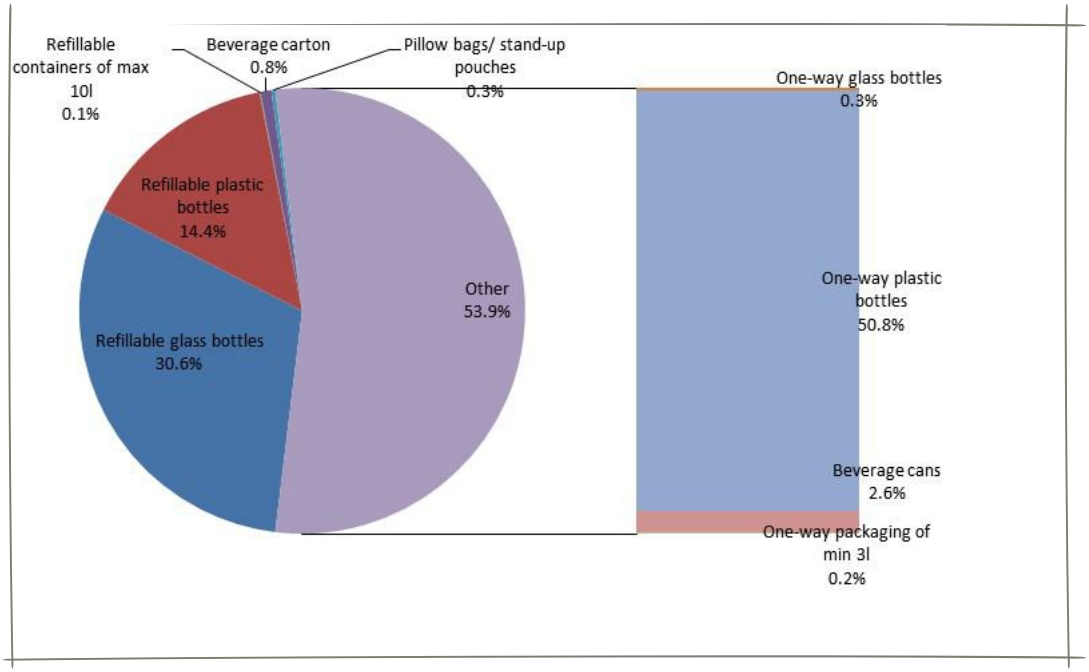


Figure 3: Structure of the different packaging types used for beverage packaging (in % for year 2014). Source: Umweltbundesamt, 2016[147]

According to the latest revision of the Packaging Ordinance, promotion of the refillables will continue to be pursued. The law foresees few concrete steps to raise the share of refillables. This includes that retailers will have to take measures to make more visible to consumers the difference between one-way and refillable bottles, by dedicating separate shelf space for each category and using clear marking. Producers themselves have voluntarily committed to improve the marking of one-way beverage packaging, by including the amount of the deposit as well as mentioning the words “one-way” and “deposit”. Further, the deposit will be expanded to include other drinks which had been exempted so far, such as fizzy fruit juice[148].

The new Packaging Law coming into effect in 2019, ecologically advantageous one-way packaging will no longer exist. The law will contain a target refillable quota of 70% which is non-binding. In 2020-2021, the refillable situation will be assessed and a decision will be taken on what to do.

With regards to the system results, in 2016, 96% return rate was reported for cans and 98% for plastic bottles[149]. As the system is not managed centrally, there is certain lack of transparency. There are no official statistics about the return rates of the different materials. The overall return rate is assumed to be 98 - 98.5% based on information communicated by DPG and other industry players.

Collection points (retailers) own the material and can decide what to do with it: to organise the recycling themselves or to sell it to recycling market. One retail chain in particular uses recycled PET from collected bottles to replace virgin material for own retails-branded packaging[150].

147 Umweltbundesamt – Packmittelstruktur des Getränkeverbrauchs 2014 (Packaging structure of beverage consumption 2014). 2016 [report]

148 BMUB – Mehrweg und Verpackungsgesetz: Häufig gestellte Fragen (Reusable packaging and packaging law: Frequently asked questions) [website]; BMUB – Pfandflasche = Mehrwegflasche??? (Returnable bottle (deposit) = returnable bottle (reuse) ???). 2016 [website]; BGBl. I 2017 S. 2234 – Gesetz zur Fortentwicklung der haushaltsnahen Getrennterfassung von wertstoffhaltigen Abfällen (Law on the development of household separate collection of recyclable waste). 2017 [website]

149 SUEZ – How a deposit return scheme for ‘on the go’ could be designed for the UK. 2018. p. 1 [report]

150 Lidl – Jede Flasche zählt (Every bottle counts) [website]

THE CASE OF ICELAND

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

A deposit system on non-refillable metal, plastic and glass packaging has been in place in Iceland since 1989, thus making it the first country to set up a deposit system on a national scale for such a wide range of beverage containers[151]. The reasons for the establishment of the system were protection of nature and the environment as well as increase in packaging recycling[152]. To prevent littering it was decided that the DRS system would accept crushed material, as is still the case, to prevent that those units would be left in the nature.

LEGAL BASIS, SCOPE AND TARGETS. LINKS TO OTHER POLICIES OR INSTRUMENTS

The Law[153] and the Regulation[154] on disposable packaging for beverages serve as a basis to the DRS system in Iceland. They stipulate that all beverages in disposable containers made of metal, glass and plastic are subject to a fixed deposit. The deposit is set at 16 ISK [0.13 EUR] on each packaging unit and can be increased in accordance with the changes in the consumer price index. An additional deposit (handling fee) is levied on every packaging unit of metal, glass and plastic according to the material. Importers and domestic producers pay the deposit to the customs/ tax authority respectively, which pass the money to the deposit operator. The DRS operator is established as a limited liability company run jointly by the industry and the government. Its tasks are to take care of the deposits and ensure the establishment and maintenance of an effective collection of deposit-bearing packaging throughout the country, as well as its recycling.

The DRS covers all ready-to-drink beverages, wine and liquor. An exception is made for packaging of milk, milk-containing products and juice extract[155]. The government is currently pushing to remove the exceptions and to add also milk products and juice extracts to the system.

151 Endurvinnslan – Deposit system [website]

152 Endurvinnslan – Um okkur (About us) [website]

153 Law 52/1989 – Lög um ráðstafanir gegn umhverfismengun af völdum einnota umbúða fyrir drykkjarvörur (Legislation regarding environmental pollution caused by disposable packaging for beverages) [website]

154 Regulation 368/2000 - Reglugerð um söfnun, endurvinnslu og skilagjald á einnota umbúðir fyrir drykkjarvörur (Regulation on collection, recycling and delivery of disposable packaging for beverages) [website]

155 Endurvinnslan – Deposit system [website]

The target for return rates is set with the Environment ministry at 90% for aluminium cans and PET bottles and 85% for glass bottles. It is calculated as only from the DRS system.

The Law on recycling fees[156] aims to create economic conditions for the reuse and recycling of waste, lower the volume of waste going to final disposal and ensure the proper disposal of hazardous substances. Following the "polluter-pays" principle, recycling fees are to be imposed on certain products incl. packaging, to cover the costs of waste collection, transport and treatment. Products are divided in a set of categories and the respective revenues should be used exclusively to cover the expenses for that category. The Icelandic Recycling Fund (IRF) – is a state-owned agency under the Ministry of Environment. It administers the recycling fees and organises an efficient management system for those products covered by the law, through tenders and contracts as appropriate.

According to the Waste Management Law[157], the local authorities are responsible for the collection system for household waste and for communicating to the citizens. The operational aspects are usually outsourced to private waste management companies. There is no rule as to how packaging waste should be collected – this is decided by the local authorities and can be influenced by proposals of the private actors submitting a tender for the collection and management of recyclable waste fractions. There are three prevailing collection methods: kerbside, neighbourhood bring banks and central recycling stations with regular opening hours. The collection and treatment of packaging from households is partly financed by the municipality (through a share of the total waste fees from households, which should be adjusted to the actual total waste management costs) and partly by the packaging recycling fees collected by the IRF[158].

System functioning, roles and responsibilities of main stakeholders

Deposit operator

Flöskumóttaka
Endurvinnslan

The DRS system in Iceland is operated by Endurvinnslan. The company is responsible for managing the collection of all disposable drinking containers, paying back the deposit to the consumer, preparing collected packaging for export and selling it for recycling.

Endurvinnslan is owned by:

- The state (Ministry of Finance and Economic Affairs)
- The State alcohol and tobacco company of Iceland (Vínbúðin)
- The Icelandic association of Local Authorities (Samband íslenskra sveitarfélaga)
- Two metal treatment companies (Alkan and Elkem)
- Icelandic scout association (Bandalag íslenskra skáta)
- Icelandic association of merchants (Kaupmannasamtök Íslands)

156 Law 162/2002 – Lög um úrvinnslugjald (Law on recycling fee) [website]

157 Law 55/2003 – Lög um meðhöndlun úrgangs (Waste Management Law) [website]

158 Fråne A., Stenmarck Å., et. al. – Collection & recycling of plastic waste. Improvements in existing collection and recycling systems in the Nordic countries". Nordic Council of Ministers 2014 [report]

- Two Icelandic drink companies (Ölgerðin and Coca-Cola)[159]

Endurvinnslan operates 60 return facilities all over Iceland where consumers can return their empty beverage packaging and get their deposit paid back. The deposit value is the same for all bottles and cans. It is set at 16 ISK [0.13 EUR][160]. However, the different materials (metal, glass, and plastic) have their own financing and no cross-financing between them is allowed.

Once the one-way containers have been collected together and passed through preliminary processing by Endurvinnslan, they are sent for recycling and recovery.

Endurvinnslan finances its operations through the deposit fees collected by the State treasury from importers and domestic producers, as well as through revenues from sales of exported waste and unredeemed deposits[161]. The total cost of the system is approximately 4.8 ISK [0.04 EUR] per packaging unit.

Producers

Producers and importers of drink containers defined by legislation pay a fixed deposit per unit put on the market. The importers pay a deposit at custom clearance and domestic producers pay to the tax authority together with excise duties. Additionally deposit is applied on every unit of packaging of steel, glass and plastic materials. No deposit is collected for the exported beverages[162].

Table 1: Deposit fees (amount excl. VAT)

	Metal	Glass		Plastic	
General deposit		> 500 ml	<= 500 ml	Coloured	Uncoloured
16 ISK	4.5 ISK	5.3 ISK	3.9 ISK	3.2 ISK	1.3 ISK
[0.13 EUR]	[0.04 EUR]	[0.04 EUR]	[0.03 EUR]	[0.03 EUR]	[0.01 EUR]

Retailers

Retailers buy packaged beverages from importers and manufacturers with deposit fee already included in the price. They do not have any obligations in terms of collection or refunding of the deposit, since these tasks are performed by Endurvinnslan.

Consumers

Consumers can return empty deposit-bearing beverage containers and claim their deposit back at 60 reception centres operated by Endurvinnslan all over Iceland. Since 2008, Endurvinnslan started using RVMs to classify and count drinks packaging by barcodes thus saving time. Currently there are 7 such automated locations and it is planned are to expand this technology to other centres in the coming years. The remaining majority of reception centres are not equipped with RVMs so the delivered containers need to be counted and sorted manually into the different categories upon delivery[163].

159 Endurvinnslan – Eigentur (Ownership) [website]

160 Endurvinnslan – Deposit system [website]

161 Fråne A., Stenmarck Å., et. al. – Collection & recycling of plastic waste. Improvements in existing collection and recycling systems in the Nordic countries". Nordic Council of Ministers 2014 [report]

162 Regulation 368/2000 - Reglugerð um söfnun, endurvinnslu og skilagjald á einnota umbúðir fyrir drykkjarvörur (Regulation on collection, recycling and delivery of disposable packaging for beverages) [website]

Another options for return is through NGOs, sport clubs, scout associations or voluntary rescue teams which collect beverage containers as a “donation” to finance their activities or raise money for specific projects. Such organisations have either set up their own collection containers at different locations (close to petrol stations, tourist destinations or in front of their offices) or their representatives go from house-to-house. Once they have collected certain number of containers, they will themselves deliver them to a reception centre and keep the deposit for themselves[164]. The scouts have approximately 200 kerbside containers where consumers can donate to the scouts the deposit fee.

Supervision

The Ministry of Environment and Natural Resources supervises the DRS. Endurvinnslan is obliged to regularly send reports on the operation of the system, including the number of returned packaging by type [165].

163 Endurvinnslan – Talningav (Reception centres) [website]

164 Fråne A., Stenmarck Å., et. al. – Collection & recycling of plastic waste. Improvements in existing collection and recycling systems in the Nordic countries". Nordic Council of Ministers 2014 [report]

165 Regulation 368/2000 - Reglugerð um söfnun, endurvinnslu og skilagjald á einnota umbúðir fyrir drykkjarvörur (Regulation on collection, recycling and delivery of disposable packaging for beverages) [website]

RESULTS

The recycling rate for drink containers in Iceland has historically been approximately 85%. The recycling rate per product is: 90% for aluminium, 87% for PET bottles and 83% for glass. In 2011-2012 the rate increased to 87% followed by an increase to 90% in 2014. In the last few years the rate has been dropping– this has been attributed to the number of tourists who are unfamiliar to the system[166].

All plastic and metal containers are sent abroad for recycling (exported mainly to the Netherlands). Glass packaging is shredded and used in Iceland. The collected materials are mainly exported and recycled outside of Iceland since the limited number of inhabitants makes it economically unattractive to invest in recycling facilities such as paper mills, glass works or plastic factories. There are 3 aluminium factories situated on the island but no deposit-subject cans are recycled in Iceland. The glass bottles are neither exported for recycling neither recycled in Iceland. A report commissioned by Endurvinnslan and the IRF in 2014 concluded that it is important from an environmental perspective to collect, export, sort and recycle glass from Iceland. However, according to Endurvinnslan, the environmental benefit of exporting glass for recycling abroad is mostly outweighed by the CO2 emissions of the transport and the related costs. In order to be profitable, glass factory on the island should have the capacity to produce more than ten times the amount of glass available in Iceland. Therefore, the collected glass is used primarily in landfill stabilisation to replace gravel (by Sorpa – the waste management company for six municipalities of the Reykjavik region) and in road construction[167]. Because of these reasons, Endurvinnslan generally is not in favour of glass beverage packaging[168]. Nevertheless, it is exploring options to try to recycle glass.

The value of exports in 2017 reached 215 million ISK [1.74 million EUR]. In terms of material quantities, Endurvinnslan sells about 750 tonnes of aluminium and 1,800 tonnes of plastic per year.

Littering has been a main motivation behind the introduction of the DRS. According to Endurvinnslan, the system has indeed been successful in reducing litter which is today much less common than it used to be back in 1989 and is composed of materials which are not subject to the beverage DRS[169].

166 Endurvinnslan – Recycling rate [website]

167 Endurvinnslan – Um okkur (About us) [website], Gler (Glass) [website]

168 Mbl.is – Glass a hard product for Endurvinnslan [website]

169 Mbl.is – Glass a hard product for Endurvinnslan [website]

THE CASE OF LITHUANIA

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

The DRS for one-way beverage containers of glass, metal and plastic materials was introduced on 1 February 2016. Until then, a deposit was applied only to refillabe glass containers used for beer, alcoholic beverages, soft drinks, mineral water, and juice. As of 2016, both systems for refillable and non-refillable beverage containers exist in parallel.

The incentive to introduce the system was grounded in the increasing environmental pollution by one-way containers, especially those of beverages. Additionally, it has been noted that separate waste collection as well as separation of recyclable waste from the municipal waste stream was not efficient enough[170]. In 2013, only 53.8% of packaging waste was collected for recycling which meant the recycling target of 60% was not reached.

Having analysed the successful implementation of a DRS in other EU countries and having noticed its benefits – notably reduced littering, as well as facilitation of the collection of high-quality recyclable material – the Lithuanian government decided to introduce it in Lithuania as well.

The beverage industry welcomed the initial decision of the government. For instance, the Association of the Beer Industry noted that they perceive a DRS as the cheapest option for their industry and that this system has the potential to be more effective than a container-based collection[171]. The DRS is seen as complementary to a container-based system and as beneficial in terms of speeding up the recycling process, as only less than 25-30% of beverage containers were collected through the container-based system[172]. One of the biggest beer producers in the country also expressed their support for the introduction of the system as they saw it as an investment into ecology, an aspect which was in line with the company's identification as being socially responsible[173].

General opinion polls were conducted and showed that the majority of the public was in favour of DRS. 67% of citizens noted their support for the extension of the existing DRS for glass bottles to also include

170 Government of the Republic of Lithuania – Lietuvoje siūloma įdiegti vienkartinių pakuočių užstato sistemą (In Lithuania, it is proposed to install a one-time packaging collateral system). 2014 [website]

171 Lrt.lt – Užstatas už bet kokią tarą taps įprastas (The security for any container will become routine). 2014 [website]

172 Galadauskas, S. - Pakuočių Atliekų Tvarkymo Situacija Gamintojų Ir Importuotojų Akimis – Lūkesčiai, Rūpesčiai Ir Viltys (The Situation of Packaging Waste Management in the Eyes of Manufacturers and Importers - Expectations, Worries and Hope). Lietuvos aludarių gildija 2014 [report]

173 UTENOS - R. Viršilas: Užstato sistema išvalys miškus nuo butelių (The deposit system will clear forests from bottles). 2015 [website]

other one-way beverage containers into the system[174].

However, "Žaliasis taškas" (Green dot) – the biggest organisation responsible for recycling the packaging materials of consumer goods expressed their opposition to the introduction of the DRS. The organisation noted that the DRS would only concern 15% of all the packaging (whose collection would improve significantly) but the remaining packaging collection would be negatively impacted. Additionally, the organisation noted that with the introduction of the DRS the cost of the management of packaging waste would increase. Therefore, it advocated for further expansion of the separate collection system based on bring-points instead of the introduction of a DRS[175].

In 2017, the Lithuanian Parliament considered a suggestion to expand the DRS to include all kinds of alcoholic beverages[176]. This suggestion was met with a strong opposition from the producers, noting that such expansion would mean that around 84% of glass containers currently covered by separate collection would be transferred to the DRS. As a result, collective glass containers would become nearly redundant because of inefficiency and high cost[177].

Legal basis, scope, and targets. Links to other policies or instruments

The main piece of legislation related to the DRS in Lithuania is the Law on Packaging and Packaging Waste[178]. Following necessary amendments, on 1 February 2016 a DRS for disposable packaging has been introduced, requiring producers and importers to charge a fixed deposit if:

a. They put on the Lithuanian market alcoholic (beer, fruit wine, beer or wine cocktails) and non-alcoholic beverages (soft drinks, water, kvass, juices, and nectar);

b. These drinks are filled in primary one-way glass, plastic or metal containers;

c. These packages are in volume of more than 0.10 l but less than 3 l.

An exception is made and deposit is not charged if the products comprise wine-based drinks contained in one-way glass packaging – these have to be thrown away in the regular glass containers (if packaged in plastic or metal containers then the deposit applies to them). Further exception is made to products which are transported or exported from Lithuania by companies or through third persons and which are subject to the deposit system, since in this case packaging waste will accumulate in another country and producers and importers will not have possibilities to return the charged deposit fee. An exception also applies to products sold to operators or users of air, water, road, and railway transport vehicles under the Lithuanian jurisdiction, which transport passengers by international routes, if such drinks are meant to be sold to and/or consumed by passengers of transport vehicles.

The deposit value for packaging (both one-way and refillable) is approved by the Ministry of Environment, upon consultation with the deposit system operator. The deposit value is established on a yearly basis. As of October 2015, the approved value for all packaging subject to deposit is 0.10 EUR.

The targets were set for the period from 2016-2020 by the Lithuanian Government. For the first year of

174 Lrt.lt – Tyrimas: dauguma gyventojų – už vienkartinių pakuočių užstatą (Survey: most residents - for a one-time pledge deposit). 2013 [website]

175 Lrt.lt – Tyrimas: dauguma gyventojų – už vienkartinių pakuočių užstatą (Survey: most residents - for a one-time pledge deposit). 2013 [website]

176 Law lx-517 – PAKUOČIŲ IR PAKUOČIŲ ATLIEKŲ TVARKYMO ĮSTATYMO NR. IX-517 11 STRAIPSNIO PAKEITIMO (Packaging and packaging waste management law no. lx-517 amendment to article 11) [website]

177 Prime Minister, Minister of the Environment, Minister of Economy, and Minister of Finance – Kreipimasis dėl vienkartinių pakuočių užstato sistemos plėtros pagrįstumo (Applying for the reasonableness of the development of a one-time security deposit system). 2017 [report]

178 Law lx-517 – PAKUOČIŲ IR PAKUOČIŲ ATLIEKŲ TVARKYMO ĮSTATYMO NR. IX-517 11 STRAIPSNIO PAKEITIMO (Packaging and packaging waste management law no. lx-517 amendment to article 11) [website]

introduction (2016), the goal was to collect 55% of all the one-way containers that were released in the internal market. For the following years the targets were increased: 2017 - 70%; 2018 – 80%; 2019 – 85%; 2020 – 90%. The same targets are set for all types of containers (glass, plastic, and metal)[179].

The Law on Packaging and Packaging Waste establishes that producers and importers are responsible for the packaging waste resulting from the goods placed on the market. They shall organise separate collection of all packaging waste resulting from the goods placed on the Lithuanian market and/or participate in such packaging management in the waste management systems established by the municipalities. In case producers and importers place goods packaged in one-way packaging subject to a deposit, they shall participate in the DRS.

The general packaging waste is managed by three EPR companies: "Žaliasis taškas" (Green dot), "Pakuočių tvarkymo organizacija" (Package management organization) and "Gamtos ateitis" (The future of the nature)[180] [181]. There is a separate DRS for refillable containers which are collected by fillers themselves (although RVMs accept refillable bottles but no deposit is refunded for them).

Additionally, Law on the Tax on Environmental Pollution foresees that producers and importers shall pay a pollution tax for polluting the environment with goods and/or packaging. An exception is granted on the basis of the proportion of fulfilled recovery and/or recycling target[182]. Additionally, producers and importers releasing less than 0.5 tonnes of packaging to Lithuanian market are also exempt from paying the tax. This exemption is not applied to one-way beverage containers subject to deposit and all reusable containers[183].

Table 1 : Environmental Pollution Tax, 2017[184]

Packaging type	Environmental Pollution Tax (EUR per tonne)
Glass	57
Plastic	521
PET	579
Composite	579
Metal	753
Paper and cardboard	28
Other	57
Wood	57

179 Government of the Republic of Lithuania – Specialistai aiškina: užstato už vienkartines pakuotes sistema (Experts explain: a system of security for disposable packaging). 2016 [website]

180 Aplinkos apsaugos agentura - Gamintojų ir importuotojų organizacijų užimamos pakuočių rinkos dalys (Package market shares held by producer and importer organisation) [website]

181 Annex 1 lists more information with regards to changes in volumes of packaging released and collected by two of the PROs as well as the set fees for producers

182 Law No VIII-1183 – Law on pollution tax. 1999 [website]

183 Law lx-517 – PAKUOČIŲ IR PAKUOČIŲ ATLIEKŲ TVARKYMO ĮSTATYMO NR. IX-517 11 STRAIPSNIO PAKEITIMO (Packaging and packaging waste management law no. lx-517 amendment to article 11) [website]

18 Government of the Republic of Lithuania – Apmokestinamosios pakuotės rūšys ir mokesčio tarifai 2017 m. (Taxable packaging types and tax rates in 2017) [website]

System functioning, roles and responsibilities of main stakeholders

Deposit operator

Since February 2016, officially there are two DRS operators: "Užstato sistemos administratorius" (USAD) and "Užstatas". However, the later one has not yet initiated its activities and USAD is de facto the only DRS operator in the country.

USAD is a non-for-profit organisation whose objective is to manage the deposit system, starting with collection of the packaging waste and ending with it being recycled, as indicated in the Law on Packaging and Packaging Waste. Its founding members are large beverage producers: the Lithuanian Association of Breweries; the Association of Lithuanian Trade Enterprises; and the Lithuanian Natural Mineral Water Manufacturers' Association. Combined, the founding organisations are responsible for more than 80% of total beverage containers released on the Lithuanian market[185].

Upon the establishment of the operator, each founding partner contributed with the amount equal to 14,481 EUR[186]. These companies also guaranteed USAD loans to banks[187]. Initial investment to the DRS system reached 29 million EUR: 22 million EUR were allocated to developing a network of RVMs and 7 million EUR were invested in the counting and storing centre near Vilnius. The counting centre, rented by USAD, is used for gathering all collected beverage packaging and preparing it for recycling. Out of the 7 million EUR, 4 million EUR were invested into real estate and infrastructure and 3 million EUR in sorting equipment as well as computer software used in the counting centre.

Main responsibilities and tasks of USAD are:

- Supplying the means of collection to retailers;
- Reimbursing collection costs to retailers;
- Taking care of transporting the collected packaging to the counting centre;
- Taking care of the inspection and preparation of the packaging for processing at the counting centre;
- Selecting processors for recycling the collected packaging;
- Managing accounting and the flow of the deposit, obtaining this from producers and paying it to the retailers that collect the packaging;
- Supervising implementation of the tasks prescribed to producers for the management of packaging waste;
- Conducting educational activities with regards to the DRS and management of packaging waste.

USAD concludes contracts with producers subject to deposit obligations. Contracts include procedures for the administration of deposits, the submission of reports and information, the registration of products, and the obligations of USAD for carrying out tasks related to the management of packaging waste.

185 USAD – Home [website]

186 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2016 - 2018 metams (Funding scheme for the security system for loading packages for 2016-2018). 2015 [report]

187 USAD – Lietuvoje įrengs taromatų tinklą už 22 mln. EUR (Lithuania will install a network of customers for 22 million EUR). 2015 [report]

Fulfilling its obligation to supply the means of collection to retailers, USAD coordinated the instalment of 1,000 RVM before the introduction of the DRS (750 in 2015, 250 until 1 February 2016)[188]. The installed RVMs are owned by their manufacturer, who is also responsible for their maintenance and repair. USAD compensates the manufacturer of the RVMs based on the total number of returned one-way packaging via RVMs. For the initial period 2016-2018, the compensation was set at 0.01632 EUR per each packaging irrespective of the packaging type and actual expenses of the manufacturer[189]. Additionally, USAD is responsible for supplying other collection means for retailers (special collection bags, stickers, and bag sealers).

Table 2 : Collection costs (in EUR)

	2016[190]	2017[191]
RVM related costs	5,994,019	7,646,614
Other collection means	776,685	637,053

The transportation from the retailer to the counting centre and from the counting centre to the recycler is organised by USAD who hires necessary vehicles to perform this task.

Table 3 : Transportation costs

	2016[192]	2017[193]
Transportation from retailers to counting centre	1,867,926	2,307,243
Transportation from counting centre to recycler	141,051	no data

Costs related to the system are financed by unredeemed deposits, producers' fee and the income from selling the materials.

Table 4 : Total income 2016-2018 (in million EUR)

	Total 2016[194]	Total 2017[195]	Total 2018[196]
Unredeemed deposits	14.38	4.73	4.05
Administrative fees collected from producers	1.43[197]	14.40	13.23
Sold material	4.72	7.33	6.58
Total	20.53	26.46	23.86

188 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2016 - 2018 metams METINĖ ATASKAITA UŽ 2016 METUS (Funding scheme for the security system for loading packages for 2016-2018 ANNUAL REPORT FOR 2016). 2017 [report]

189 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2017 - 2019 metams (Funding scheme for the security system for loading packages for 2017-2019). 2017 [report]

190 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2016 - 2018 metams METINĖ ATASKAITA UŽ 2016 METUS (Funding scheme for the security system for loading packages for 2016-2018 ANNUAL REPORT FOR 2016). 2017 [report]

191 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2017 - 2019 metams METINĖ ATASKAITA UŽ 2017 METUS (Funding scheme for the security system for loading packages for 2017-2019 ANNUAL REPORT FOR 2017). 2018 [report]

192 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2016 - 2018 metams METINĖ ATASKAITA UŽ 2016 METUS (Funding scheme for the security system for loading packages for 2016-2018 ANNUAL REPORT FOR 2016). 2017 [report]

193 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2017 - 2019 metams METINĖ ATASKAITA UŽ 2017 METUS (Funding scheme for the security system for loading packages for 2017-2019 ANNUAL REPORT FOR 2017). 2018 [report]

194 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2016 - 2018 metams METINĖ ATASKAITA UŽ 2016 METUS (Funding scheme for the security system for loading packages for 2016-2018 ANNUAL REPORT FOR 2016). 2017 [report]

195 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2017 - 2019 metams METINĖ ATASKAITA UŽ 2017 METUS (Funding scheme for the security system for loading packages for 2017-2019 ANNUAL REPORT FOR 2017). 2018 [report]

196 USAD – Finansinis skaidrumas (Financial Transparency) [website]

197 From 1 February 2016 until 31 October 2016, producer fees were set at 0.00 for each packaging material type. Between November 1 and December 31 2016, producer fees are set accordingly: PET – 0.025; Metal (steal) – 0.025. Packaging from PET and glass were except from producer fees during that period. Zero tariffs were set before the introduction of the system. At that time, USAD had contracts signed with 8 companies. As the nearly 300 additional contracts were signed until the end of 2016, tariffs were recalculated.

The DRS operator also has to carry out public information and awareness raising campaigns. To fulfil this obligation, it has to spend no less than 1% of total yearly revenue[198]. The campaign of USAD focuses on three pillars[199]:

- Continuously inform the public about the waste management system in the country, including the DRS. Inform them about the changes and modification in the waste management sector that are influenced by the DRS.
- Encourage the public to participate in the DRS as actively as possible. Explain their role in the system and system set-up; highlight not only the practical (monetary) benefits for the citizens, but also the benefits for the environment (cleaner environment, amount recycled, etc.)
- Educate the public about the necessity to recycle waste, by informing them about the waste recycling in general and the DRS in particular as well as emphasise the role of the public in the functioning of system.

To achieve the communication aims, visual materials adapted for different age groups, as well as other informational materials, are developed and disseminated through various channels (TV, radio, press, etc.).

Producers

Apart from being obliged to charge a deposit and refund it to the retailers, producers and importers are responsible for labelling their goods in accordance with the requirements foreseen in the Law on Packaging and Packaging Waste. Each marketed packaging has to be labelled with a barcode that identifies the producer as well as the appropriate deposit mark[200].

Other obligations include:

- Indicating the product price and value of the packaging deposit in the relevant accounting documents.
- Delegating organisation of the deposit system for one-way packaging to its administrator.
- Covering the costs of participating in the deposit system that relate to management of one-way packaging waste collected under the system and its administration

Producers shall pay administrative fees to the DRS which can be recalculated on a yearly basis. In addition, they shall pay: 1) one-time registration fee (50 EUR); 2) one-time packaging registration fee (35 EUR) to the DRS.

198 Law lx-517 – PAKUOČIŲ IR PAKUOČIŲ ATLIEKŲ TVARKYMO ĮSTATYMO NR. IX-517 11 STRAIPSNIO PAKEITIMO (Packaging and packaging waste management law no. lx-517 amendment to article 11) [website]

199 USAD – Home [website]

200 USAD – Gamintojams ir importuotojams (Manufacturers and importers) [website]

Table 5: Producers fees[201] (as of 1 January 2018)[202]

Per year per Packaging type	PET	Aluminium	Steal	Glass
2016[203]	0.025	-	0.025	-
2017	0.03	0.015	0.03	0.025
2018	0.03	0.011	0.03	0.04

As reusable packaging is also accepted in the reverse vending machines, producers of reusable containers shall pay 0.0175 EUR per each packaging collected via a RVM to the DRS.

Retailers

Retailers of one-way packaging are obliged to accept packaging waste subject to a deposit and return the deposit, irrespective of whether they sell products in identical packaging. Initially, this obligation was not applied to retailers when their retail area does not exceed 300m² with the exception of merchants who trade from village and town shops with a retail area not exceeding 90m², a department store, a kiosk, a gas station or a public catering establishment. However, on 12 October 2017, the Lithuanian Parliament adopted changes related to the DRS and decided to expand it by obliging more food stores to take part in it. Notably, the change has been made with regards to the size of the stores located in the small cities and countryside regions. With the adopted change, it is now shops with a retail area not exceeding 60m² which will be exempted. The new legislation will come into force in May 2019. All other sellers of packaging are allowed to participate in the system on a voluntary basis.

Other obligations include:

- The collection shall be organised at the trading venues, or nearby sites that are no further than 150m away. The collection is organised during the same opening hours as those of the retailer.
- Retailers shall indicate the value of the deposit on the price tag of the product.
- Written information on how consumers can return refillable and one-way packaging shall be provided on a poster (at least A3 dimensions).

One-way packaging shall be accepted but the deposit shall not be refunded if:

- The container is not labelled with the deposit mark or the mark is not clearly visible;
- The container is not marked with a barcode or the barcode is damaged;
- The container is not completely empty;
- The shape of the container is damaged to the extent that it is not possible to identify it.

Retailers can collect empty packaging manually or with RVMs. The packaging legislation foresees that the DRS administrator is obliged to provide RVM to retailers. Each store can submit an application to receive an RVM at any time.

Large stores that collect a monthly average of 40,000 or more units of one-way packaging can be

201 Additional fees apply in case higher number of beverage packaging is collected over the last 12 months than that indicated by the producer.

202 USAD – Gamintojams ir importuotojams (Manufacturers and importers) [website]

203 Fees applied from 1 November 2016 until 31 December 2016

provided with the RVM model (T-9 model) that requires a special facility (with an area of at least 30 m²) where the collected packaging is automatically sorted, compressed, and stored. Medium-sized and smaller stores that collect a monthly average of 10,000-40,000 pieces of packaging under the deposit system can be provided with the RVM (T-63 model) that does not require any special facilities. It can be set up on or near a shop floor, requiring an area of at least 4 m². Packaging collected by the RVM is automatically sorted and compressed, and then moved from the shop to a place designated for storage.

In the beginning of 2018, there were a total of 2,713 collection points (RVMs and manual)[204], of which 1,006 RVMs: 900 RVMs were owned by the RVMs manufacturer (compensated by USAD), 106 were owned by the retailers themselves[205]. Those retailers that purchased RVMs are compensated by USAD in the same manner as the RVMs manufacturer and thus receive 0.014 EUR for each packaging unit collected.

Additionally, the DRS operator pays handling remuneration to retailers based on the collection method.

Table 6 : Handling remuneration fees as of 1 January 2018 (EUR/unit)

Collection method	PET	Aluminium/Metal	Glass
RVM with compressor	0.0175	0.0137	0.0284
Manual collection/ RVM without compressor	0.0138	0.0118	0.0148

Consumer

Upon returning empty beverage container subject to deposit, the consumer can:

- Receive the deposit in cash or,
- Upon request, have a rebate to his purchase of goods or services equal to the amount of the deposit or,
- Upon request, make a donation to the beneficiaries cited in the Law of the Republic of Lithuania on Charity and Sponsorship, of an amount equal to the value of the deposit.

Supervision

The Ministry of Environment is the responsible institution regulating the DRS system in Lithuania. USAD is accountable to the Ministry of Environment and thus has to submit organisational, financial and public information plans as well as reports showing how those plans were executed.

204 USAD – Per 2 metus Lietuvos gyventojai pridavė 1 mlrd. vienkartinių pakuočių (In 2 years, Lithuanians have given 1 billion disposable packaging). 2018 [website]

205 USAD – Užstato Už vienkartines pakuotes sistemos FINANSAVIMO SCHEMA 2017 - 2019 metams (Funding scheme for the security system for loading packages for 2017-2019). 2017 [report]

RESULTS

In the first year (2016) after the DRS has been introduced in the country, 455 million one-way beverage containers have been returned by the citizens, which represented more than 75% of quantities put on the market[206]: 8,331 tonnes of plastic, 2,610 tonnes of metal and 5,422 tonnes of glass[207]. As the collected material is pure, there is no contamination with other residues and all packaging collected under the DRS has been sent to recycling. The DRS operator sells the collected materials through an open-tender procedure to waste recyclers[208].

Over the second year (2017), 92% of all packages released into the market were collected through the DRS. It is estimated that, until the end of 2017, 538.5 million beverage containers were collected[209]. According to containers' categories, 51% of those collected are beer bottles and cans, 21% are of soft drinks, mineral and table water, and the remaining 8% consist of light alcohol drinks, juices, energy drinks, etc[210].

The results achieved far exceed the target that Lithuanian Government has set for the system. The target for 2017 was to collect 65% of containers released to the market. It has been foreseen that the system will exceed 90% only after 2020. However, seeing the success of 2017, USAD expects that, in 2018, 93% of beverage containers participating in the scheme will be collected[211].

The introduction of the DRS resulted in nearly 8% increase in recycling of three materials: glass, plastic (PET), and metal. The recycling rates of plastic increased the most of the three materials, from 54.8% to 74.4%.

Table 7 : Released and collected packaging waste by PROs and deposit-return operator (2017)

	PET			Metal			Glass		
	Released	Collected	%	Release	Collected	%	Released	Collected	%
Žaliasis taškas[212]	2243	122	50.02	7017	3922	55.89	35791	23449	65.51
PTO[213]	1141.6	563.8	49.39	4077.5	2417.7	59.29	21455.8	11526.6	53.72
Gamtos ateitis[214]	1.81	14.33		37.11	20.48		54.18	296.98	
USAD			92[215]			93[216]			83[217]

206 USAD – Vieneri metai su užstato sistema: grąžinta 455 milijonai pakuočių (One year with deposit system: 455 million packs returned). 2017 [website]

207 USAD – Informacija Savivaldybėms (Information for Municipalities). 2017 [report]

208 USAD – For Waste Processors [website]

209 USAD – Per 2 metus Lietuvos gyventojai pridavė 1 mlrd. vienkartinių pakuočių (In 2 years, Lithuanians have given 1 billion disposable packaging). 2018 [website]

210 Verslo žinios – Lietuviai butelius grąžina taip uoliai, kad jau pavijome Skandinaviją (Lithuanians are returning the bottles so zealously that we've already converted Scandinavia) [website]

211 Verslo žinios – Lietuviai butelius grąžina taip uoliai, kad jau pavijome Skandinaviją (Lithuanians are returning the bottles so zealously that we've already converted Scandinavia) [website]

212 ŽALIASIS TAŠKAS - VEIKLOS ORGANIZAVIMO PLANAS FINANSAVIMO SCHEMA ŠVIETIMO PROGRAMA 2017 METŲ ATASKAITA (ACTIVITY ORGANIZATION PLAN FUNDING SCHEME EDUCATION PROGRAM 2017 ANNUAL REPORT). 2017 [report]

213 Pakuočių tvarkymo organizacija – Metinė ataskaita 2017 (Annual Report 2017) [report]

214 Gamtos Ateitis – 2017 METŲ ATASKAITA (2017 ANNUAL REPORT). 2018 [report]

215 15min - Atliekų statistika: po 2017-ųjų pagalbos iš Lietuvos prašo net Prancūzija (Waste statistics: after 2017, even France is asking for help from Lithuania) [website]

216 15min - Atliekų statistika: po 2017-ųjų pagalbos iš Lietuvos prašo net Prancūzija (Waste statistics: after 2017, even France is asking for help from Lithuania) [website]

217 Open Access Government – Recycling: Lithuania deposit system exceeds all expectations [website]

Table 8 : Income of 2018 (in million EUR)[218]

	PET	Aluminium	Steal	Glass	Total	In %[219]
Unredeemed deposits	2.23	1.35	0.006	0.47	4.05	17
Producers fees	9.63	2.17	0.025	1.40	13.23	55
Sold material	2.39	3.88	0.002	0.30	6.58	28
Total	14.26	7.39	0.032	2.18	23.86	

Table 9 : Expenses of 2018 (in million EUR)[220]

	PET	Aluminium	Steal	Glass	Total	In %[221]
Handling remuneration for retailers	9.39	5.42	0.024	1.41	16.24	70
Transportation	2.10	0.485	0.002	0.548	3.14	14
Counting centre operation	2.12	1.30	0.006	0.215	3.64	16
Total	13.61	7.20	0.032	2.17	23.02	

An opinion survey conducted 6 months after the introduction of the DRS revealed that 78.2% of consumers describe the system as being “good” or “very good”. After the second year of operation, an opinion survey revealed that 97% of respondents think that the system is “necessary” or “very necessary”. An equal proportion of respondents noted that the system is “good” or “very good”[222]. When asked to describe the reasons for returning the empty beverage containers, the majority (73%) noted “less litter” as the main reason. 95% of respondents also noted that after the introduction of the DRS they see less litter. Additionally, 93% of participants pointed out that participating in the DRS system also contributes to the separation of other waste.

218 USAD – Finansinis skaidrumas (Financial Transparency) [website]

219 USAD – Finansinis skaidrumas (Financial Transparency) [website]

220 USAD – Finansinis skaidrumas (Financial Transparency) [website]

221 USAD – Finansinis skaidrumas (Financial Transparency) [website]

222 Diena.lt - Apklausa: lietuviai patenkinti užstato sistema (Poll: Lithuanians are happy with the deposit system). [website]

THE CASE OF THE NETHERLANDS

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

In the Netherlands, a deposit system was introduced in the early 1960s by the regulatory body for producers and retailers of beer, soda and water. At that time, bottles were predominantly made of glass. Deposit money was also levied on glass bottles for milk throughout the 1950-1980s[223]. However, starting in the mid-1980s, glass bottles were rapidly replaced by plastic (PET) bottles, especially in the soda and water markets, and by composite cartons for milk[224].

In the end of the 1980s, the Ministry of Environment aimed to reduce the negative effects of packaging on the environment. To promote product reuse and recycling the deposit system was included in the agreement on packaging policy between the government and the packaging producers in 1991 (Convenant Verpakkingen I). It prescribed a deposit on all reusable and one-way bottles and stated that the costs related to the functioning of the system were to be borne by the packaging producers. The deposit system mandated by the 1st Covenant included mandatory reuse of plastic bottles (i.e. refilling of collected used bottles). Small plastic bottles (of maximum 0.5l) started to be introduced on the market in the mid-1990s but in a gentlemen's agreement concluded during that time, the government and the producers agreed to exempt these small bottles from the deposit system. The argument was that they constituted only a marginal part of the market, and producers agreed to keep their share low (not exceeding 2% of total plastic bottles sales). However, since their introduction on the market, the sales of small plastic bottle grew significantly in the following years. Because the small bottles were left outside of the deposit system, this led to environmental loss and increased litter in the streets. Therefore, in the year 2000, the Minister of Infrastructure and Water Management aimed to extend the deposit system to small plastic bottles. The Minister faced fierce opposition from the packaging producers. In 2002, the companies managed to shelf the expansion of the deposit system by promising to reduce the number of bottles and cans in litter by 80% until 2005.

The provisions for the establishment of the DRS were included in the Decree on management of packaging and paper and board of 2005. It was foreseen that the DRS would apply to plastic and glass bottles for soft drinks and water with a volume of 0.1l or more (beverage cartons were excluded). It also envisaged a compulsory collection rate of 95%. However, this legislation was never enforced and at the

223 Stichting Ons Statiegeld – Veelgestelde vragen over statiegeld (Frequently asked questions about deposit refund) [website]

224 Smink M. – Disruptive institutional work. Deinstitutionalization of an icon: the Dutch bottle deposit system. 2015 [report]

end of 2010 the relevant provisions were deleted[225].

The DRS in the Netherlands has been a subject of continuous discussion between various stakeholders with the questions relating to whether to maintain the system, to extend it or to scrap it altogether. A report commissioned by the producers in 2012 argued that the positive environmental contribution of the DRS comes at high costs and that there would be major cost advantages in ending the system[226]. Following the report, the Dutch Government agreed to end the deposit system in place. However, later the cost advantages were shown to be exaggerated. A more recent study (2014) on the same issue carried out by the CE Delft research consultancy and commissioned by Tomra Systems (the biggest seller of RVM) suggested that the costs of recycling large PET bottles are 50% lower than those estimated in the aforementioned study[227]. Following this, in mid-2014 the government dropped its plans to abolish the deposit on large plastic bottles[228]. The guidelines for the deposit system were later included in the Packaging Management Decree of 2014.

Nonetheless, the possibility to abolish the DRS system remains. The Framework Agreement for Packaging 2013-2020 signed in 2013 between the national government and the packaging producers (the Association of Dutch Municipalities did not sign the agreement) contains several requirements that have to be fulfilled in order to abolish the DRS[229].

In 2018, the government had given the packaging producers until 2021 to boost the recycling of small bottles or face the introduction of a deposit system on them. The producers must therefore ensure that 90% of one-way plastic bottles are recycled and that the number of plastic bottles in litter is reduced by 70% - 90%. The results of the producers' efforts will be assessed in autumn 2020. If the targets have not been met, small bottles (up to 1l) will be subject to a deposit of 0.10 to 0.15 EUR from the beginning of January 2021[230]. This has come after an agreement between the producers and the government which is also open to different approaches other than a deposit system, as long as the results of avoiding littering and closed-loop recycling are achieved[231].

In the meantime, a number of organisations from the Netherlands and the neighbouring Belgian region of Flanders founded the Deposit Alliance (Statiegeldalliantie) in November 2011. Their objective is to call on their governments to introduce a deposit on all one-way plastic bottles and cans[232].

Legal basis, scope and targets. Links to other policies or instruments

In the Netherlands, packaging policy is characterised by a period of predominantly voluntary agreements (1991-2005), followed by predominantly regulatory period (2006-2012). During the period of voluntary agreements, producers and importers were effectively exempted from individual company responsibility.

225 Recycling Netwerk – Steeds meer afval van PET-flessen (Ever more waste from PET bottles) 2014 [website]

226 Thoden Van Velzen E.U., Bos-Brouwers H.E.J. – Analyse van het Nederlandse Statiegeldsysteem voor PET flessen (Analysis of the Dutch deposit return system for PET bottles). Wageningen UR Food & Biobased Research 2012 [report]

227 Warringa G.E.A., Aarnink S.J., Bergsma G.C. – Kosten statiegeldsystemen voor grote PET-flessen (The cost of the deposit return system for big PET bottles). CE Delft 2014 [report]

228 Ministerie van Infrastructuur en Milieu – Besluitvorming vrijgeven statiegeld (Desposit decision-making publication). Ministerie van Infrastructuur en Milieu 2014 [document] and DutchNews.nl – Dutch to keep deposits on plastic bottles (update) 2015 [website]

229 Rijksoverheid – Raamovereenkomst tussen IenM, het verpakkende bedrijfsleven en de VNG over de aanpak van de dossiers verpakkingen en zwerfafval voor de jaren 2013 t/m 2022 (Framework agreement between Infrastructure and Environement Ministry, IenM, the packaging industry and the Association of Dutch Municipalities, VNG, on the handling and litter files for the years 2013 to 2022) [document]

230 Government of the Netherlands – Breakthrough in combatting plastic soup. 2018 [website]

231 Retail Detail – Deposit for small plastic bottles in the Netherlands. 2018 [website]

232 Statiegeldalliantie – organisaties uit Vlaanderen en Nederland slaan de handen in elkaar voor statiegeld (21 organisations from Flanders and The Netherlands join forces fo a deposit system). 2017 [website]

With the Decree on management of packaging and paper and board of 2005 (which expired in 2015)[233] an important change was introduced: the companies became individually and financially responsible for the prevention, collection and recycling of their packaging put on the market. A collective organisation of producers and importers – Afvalfonds Verpakkingen – was assigned to implement the Decree and organise collection and processing of packaging waste on behalf of producers[234].

The Decree also set the legal basis for the DRS as the Ministry of Infrastructure and Water Management intended to have a possibility to introduce a deposit on certain beverage packaging in case the packaging producer does not meet the set targets for collection and recycling of plastic packaging[235]. However, this provision never entered into force. Therefore, de facto, there is no legislation in place for mandatory deposit. However, if a producer does not charge a deposit, he has to join the Afvalfonds Verpakkingen and pay fees which are higher than in the DRS (eg. as much as 0.25 EUR per bottle compared to 0.02 EUR per kilo of deposit PET).

Currently, the guidelines for the deposit system are included in the Packaging Management Decree of 2014[236]. It requires those marketing drinks to charge a deposit. The take-back of the packaging and the repayment of the deposit shall occur at the same place where packages of the same material are marketed (or in the "immediate vicinity"). Exception is granted for places of sale with a surface of less than 200m^2 as they can limit the take-back to packages of the same type as marketed by the point of sale. Further exceptions are applicable to medicinal drinks, wine (and fruit wine), spirits and alcoholic beverages, packages filled with beverage directly at the retailer, beverage packaging of 100ml or less. Producers or importers who are putting less than 500,000 units of beverage packaging on the Dutch market per year are also exempted from the deposit obligation.

The Decree also notes that the level of deposit is determined by ministerial regulation, and it can vary depending on the type and volume of packaging. The deposit mark is also determined by the Ministry and shall be included on the packaging by the producer in a clear and indelible manner[237].

Currently, the DRS system is administered by the Stichting Retourverpakkingen Nederland (SRN) and applies to large PET bottles (0.75 l)[238]. One-way cans and small plastic bottles are exempt from the system[239]. The deposit amount for those plastic bottles included in the SRN system stands at 0.25 EUR[240].

In parallel, there is a voluntary deposit system on reusable glass beer bottles (from 0.2 to 0.5 l). The introduction of such system originated from the Dutch breweries themselves and was motivated by environmental, economic and market incentives[241]. The deposit for reusable glass bottles is 0.1 EUR.

In principle, two systems (for reusable glass containers and large PET bottles) operate as one from the consumer perspective, as the same RVMs are used to collect both types of packaging[242].

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233 Decree 2005 – Besluit van 24 maart 2005, houdende regels voor verpakkingen, verpakkingsafval, papier en karton (Besluit beheer verpakkingen en papier en karton) (Decree of 24 March 2005, containing rules for packaging, packaging waste, paper and cardboard (Decree on management of packaging and paper and cardboard)), expired as of 01 January 2015. [website]

234 Rouw M., Worrell E. – Evaluating the impacts of packaging policy in the Netherlands. Resources, Conservation and Recycling 55. 2011. 483 – 492 [website]

235 Overheid.nl – Besluit beheer verpakkingen (Packaging management decree). 2014 [website]

236 Decree – Besluit van 27 oktober 2014, houdende regels voor verpakkingen en verpakkingsafval (Besluit beheer verpakkingen 2014) (Decree of 27 October 2014, containing rules for packaging and packaging waste (2014 Packaging Management Decree)) [website]

237 Overheid.nl – Besluit beheer verpakkingen (Packaging management decree). 2014 [website]

238 Stichting Retourverpakkingen Nederland – de Stiching (the foundation) [website]

239 CE Delft – Costs and impacts of a deposit on cans and small bottles in the Netherlands. Update. 2017 [website] and Rijksoverheid – verpakkingen en verpakkinfsafval (Packaging and packaging waste) [website]

240 Stichting Retourverpakkingen Nederland – de Stiching (the foundation) [website]

241 NVC Netherlands Packaging Centre – No mandatory deposit for beer bottles [website]

242 Thoden Van Velzen E.U., Bos-Brouwers H.E.J. – Analyse van het Nederlandse Statiegeldsysteem voor PET flessen (Analysis of the Dutch deposit return system for PET bottles). Wageningen UR Food & Biobased Research 2012 [report]

Initially, the Decree on management of packaging and paper and board of 2005 included a collection target of 95%. However, the legislation was never enforced and at the end of 2010 the relevant articles were removed from the Decree[243]. The Packaging Management Decree of 2014 does not set specific targets for the packaging collected through the DRS system. Instead, it sets national recycling targets for packaging materials in 2015: 45% of plastics, 90% of glass, and 85% of metal. Each year, the general targets for plastics (not DRS-specific) are raised by 1% until 2022, when the targets will be fixed at 52% for plastics[244].

The document implementing separate collection in the Netherlands is the National Waste Management Plan 2009-2021. It lays down the roles of different authorities with regards to separate waste collection. Municipalities are responsible for establishing a suitable separate waste collection system, promoting separation and communicating about the policy and the results. As such, every municipality can determine a unique collection system in its own way, as long as the national targets are achieved and guidelines are followed[245].

Civic amenity sites exist in each municipality and serve for collecting paper and carton, glass, plastic, metal and other waste streams. Throughout municipalities the largest differences are found between door-to-door collections and bring points. In large cities bring points are practiced rather than door-to-door collection. In towns and smaller cities with space for separate waste containers, door-to-door collection is rather organised[246].

The Packaging Management Decree foresees that companies that place packaged goods on the market are legally obliged to contribute to their recycling. For this purpose they have established the Packaging Waste Fund - Afvalfonds Verpakkingen - to collectively meet their responsibilities. The Packaging Waste Fund is a non-for-profit organisation, governed by a board of directors, who are themselves appointed by producers and importers[247]. The Packaging Waste Fund collects a packaging waste management contribution from obliged companies (depending on the material and the type of packaging) and finance the collection, recovery and correct disposal of the packaging waste (by outsourcing these activities to a partner organisation Nedvang[248]).

After the implementation of the Packaging Decree, it became clear that the packaging producers would not be able to collect and process household packaging waste as required by the legislation without the cooperation of local authorities. Therefore, the producers, the Association of Dutch Municipalities and the Dutch Ministry for the Environment signed a Famework Agreement in 2007 to establish the conditions for the cooperation[249].

A result of this cooperation is the “Plastic Heroes” system – collection of several types of plastic packaging not included in the DRS (ex. small PET bottles, plastic packaging for butter and other plastic containers such as shampoo bottles, etc.). Municipalities may decide how to organise the plastic collection and get financial compensation from the Fund. The collection could be done directly from households (in a transparent Plastic Heroes bag) or by installing a Plastic Heroes container to which consumers bring their plastic packaging waste. Alternatively, plastic packaging can be collected together

243 Recycling Netwerk – Steeds meer afval van PET-flessen (Ever more waste from PET bottles) 2014 [website]

244 Decree – Besluit van 27 oktober 2014, houdende regels voor verpakkingen en verpakkingsafval (Besluit beheer verpakkingen 2014) (Decree of 27 October 2014, containing rules for packaging and packaging waste (2014 Packaging Management Decree)) [website]

245 BiPRO, CRI, ENVIRON, ENVIROPLAN, Geotest, ACR+ – Assessment of separate collection schemes in 28 capitals in the EU: National Factsheet on Separate Collection in the Netherlands 2015 [report]

246 BiPRO, CRI, ENVIRON, ENVIROPLAN, Geotest, ACR+ – Assessment of separate collection schemes in 28 capitals in the EU: National Factsheet on Separate Collection in the Netherlands 2015 [report]

247 Afvalfonds Verpakkingen – Afvalfonds verpakkingen (the Packaging Waste Fund) [website]

248 Nedvang – Home [website]

249 Rouw M., Worrell E. – Evaluating the impacts of packaging policy in the Netherlands. Resources, Conservation and Recycling 55. 2011. 483 – 492 [website]

with metal and carton packages for beverages. In this case, waste is sorted in a later stage[250]. The recycling rate of the Plastic Heroes collection reaches 42%[251] and accounts for the majority of collected plastic packaging[252] (the DRS constituted 17% of collection in 2014[253]).

An additional campaign of the Fund is a reward system for small PET bottles – Nederland Schoon[254]. More than 70 municipalities, schools, sports clubs and other social organisations are collecting and cleaning up small plastic bottles and other packaging materials. For this activity, municipalities reward the participating entities, financed by the Fund in order to encourage consumers to collect their small bottles without a deposit on them[255].

System functioning, roles and responsibilities of main stakeholders

Deposit operators

STICHTING RETOURVERPAKKING NEDERLAND

There are several DRS operators in the Netherlands. For the vast majority of bottles (estimated at around 540 million) there is one system in which several supermarkets are connected[256]. It is operated by Foundation Return Packaging Netherlands (Stichting Retourverpakking Nederland – SRN); a non-for-profit organisation established on initiative of the soft drink and mineral water suppliers in cooperation with the food trade[257]. The SRN was established as a result of the provisions included in the 2005 Decree mandating that companies are responsible for the organisation of collection and recycling of their packaging as well as the related costs. In addition, Aldi and Lidl have developed their own closed system where deposit bottles from the SRN system are not accepted [258]. The number of bottles from Aldi and Lidl is estimated at around 110 million[259].

The SRN is responsible for the financial equalisation between producers and retailers, counting and sorting. On mandate by the producers SRN can also resell their share of collected bottles. To finance its activities, the SRN receives a contribution from the producers in form of administration fee (0.01 plus 0.02 EUR per bottle). It also handles the transfer of deposit and handling fees (VBR - Vergoeding Behandeling extra Retouremballage) between producers and retailers. The VBR aims to compensate the retailers when they have to handle more bottles than they sell. In addition to the deposit, the retailer pays 0.06 EUR to the producer/importer for every bottle they buy. The producer pays the amount back to the retailer which returns the bottle. Due to the return rate not reaching 100%, the retailer pays for handling of the bottles and thus motivates the retailer to get as many bottles as possible back.

Returned bottles from the stores are brought in large bags to distribution centres, locations where retailers have concentrated the logistics of goods. From there they are transported to 2 counting centres

250 Plastic Heroes – Veelgestelde vragen (Frequently asked questions) [website]

251 Beelen J., Hanegraaf R. et al – Upcycling the Dutch deposit-refund system: Assessing and Recommending on Improvements for Complex Systems". 2015

252 Ministerie van Infrastructuur en Milieu – Besluitvorming vrijgeven statiegeld (Desposit decision-making publication). Ministerie van Infrastructuur en Milieu 2014 [document]

253 NVC Netherlands Packaging Centre – What consumers think about ending the deposit system, 2015 [website]

254 Nederland Schoon – Home [website]

255 Rijksoverheid – verpakkingen en verpakkinfsafval (Packaging and packaging waste) [website]

256 Thoden Van Velzen E.U., Bos-Brouwers H.E.J. – Analyse van het Nederlandse Statiegeldsysteem voor PET flessen (Analysis of the Dutch deposit return system for PET bottles). Wageningen UR Food & Biobased Research 2012 [report]

257 Logistiek.nl – Retourbag-systeem voor PET-flessen is succes (Return bag system for PET bottle is a success). 2007 [website]

258 Recycling Netwerk – Waarom is er (nog) geen statiegeld op plastic flesjes en blikjes in Nederland en België? (Why isn't there deposit system for plastic bottles and cans in The Netherlands and in Belgium (yet)?). 2017 [website].

259 Thoden Van Velzen E.U., Bos-Brouwers H.E.J. – Analyse van het Nederlandse Statiegeldsysteem voor PET flessen (Analysis of the Dutch deposit return system for PET bottles). Wageningen UR Food & Biobased Research 2012 [report]

where the bags with deposit bottles are emptied into a counting machine and the bottles are scanned on barcodes. In their contract with SRN producers assume a "transport obligation" and have to organise the transport of collected bottles from retailers to a counting centre.

After the count, the bottles are compacted and can be sold and/or transported to locations where the bottles are recycled. Each bottle has an EAN-code which allows "individualising" it, i.e. identifying the respective producer. Based on counting outcomes, SRN distributes the deposits and handling fees to retailers, and writes reports for all members[260].

The retail chains Aldi and Lidl have their own closed systems. At Aldi, the bottles are automatically compacted immediately after ingestion in the RVM. At Lidl, the bottles are automatically deposited with a lift in large transparent bags. For both systems, no separate centre is necessary for counting and settlement between the various supermarkets. At Aldi, for example, settlement between the various branches takes place via the cash register[261].

Producers

According to current legislation[262], producers who put packed beverages on the market should charge a deposit on that packaging. They remain the owner of the material while outsourcing DRS-related activities to SRN and can therefore decide what SRN does with that material: transport the collected PET to a recycler in order to make new bottles or sell the materials collected. As not all bottles are brought back to the retailer, the "unredeemed deposits" are collected by the importers/producers[263].

Retailers

The retailers are responsible for organisation of collection of empty beverage containers that are subject to deposit from consumers. In order to facilitate deposit-refund service they install RMVs at their stores. In 2017, there were a total of 4,200 RVMs across the Netherlands[264].

Consumers

The consumer is required to pay the deposit at the retailer. The reverse logistics start when the consumer takes back the plastic bottle to the retailer and receives the 0.25 EUR deposit back[265]. Deposit money for refillable glass beer bottles is set at 0.1 EUR[266].

Supervision

Supervision of compliance with the Packaging Management Decree of 2014 and administrative enforcement are the responsibility of the Ministry of Infrastructure and the Environment. The manufacturer or importer who places more than 50,000 kg of packaging annually shall submit yearly reports to the Ministry of Infrastructure and the Environment by 1 August each year about its implementation of the DRS during the preceding year. The report shall be accompanied with the documents demonstrating the accuracy of the information in the report[267].

260 Stichting Retourverpakkingen Nederland – Werkwijze (Method) [website]

261 CE Delft – Costs and impacts of a deposit on cans and small bottles in the Netherlands. 2014 [website]

262 Decree – Besluit van 27 oktober 2014, houdende regels voor verpakkingen en verpakkingsafval (Besluit beheer verpakkingen 2014) (Decree of 27 October 2014, containing rules for packaging and packaging waste (2014 Packaging Management Decree)) [website]

263 Beelen J., Hanegraaf R. et al – Upcycling the Dutch deposit-refund system: Assessing and Recommending on Improvements for Complex Systems". 2015. p. 25

264 Recycling Netwerk – Waarom is er (nog) geen statiegeld op plastic flesjes en blikjes in Nederland en België? (Why isn't there deposit system for plastic bottles and cans in The Netherlands and in Belgium (yet)?). 2017 [website]

265 Beelen J., Hanegraaf R. et al – Upcycling the Dutch deposit-refund system: Assessing and Recommending on Improvements for Complex Systems". 2015

266 Recycling Netwerk – Waarom is er (nog) geen statiegeld op plastic flesjes en blikjes in Nederland en België? (Why isn't there deposit system for plastic bottles and cans in The Netherlands and in Belgium (yet)?). 2017 [website]

267 Overheid.nl – Besluit beheer verpakkingen (Packaging management decree). 2014 [website]

RESULTS

In the Netherlands, it is estimated that around 5.7 billion of cans and bottles are placed on the market yearly. Around 38.5% (2.19 billion) of these are refillable glass bottles subject to deposit. PET bottles larger than 0.75 l constitute around 1% (620 million)[46].

With regards to the system's results, it is estimated that approximately 95% of large PET bottles are returned through the current DRS system and almost all are recycled. The remaining part of large PET bottles (2-5%) is collected either through the Plastic Heroes system, residual household waste or ends up in litter[47]. The return rate for reusable glass bottles is estimated to reach 90%[48].

All bottles are recycled; most of them into new bottles, but that depends on the destination the producers choose for their bottles as they can sell the bottles themselves.

Regarding litter, it is estimated that, in 2015, large PET bottles constituted 0.3% of total packaging waste found in litter. The share of glass bottles was 0.6% accordingly[49].

Based on the results of recently conducted polls with regards to the extension of the DRS system, the general perception of the DRS in the country appears more positive than negative. A poll conducted in 2016 shows that 74% of the Dutch population is positive about the extension of the deposit system to small bottles and cans[50]. In 2018, the number increased to 80%[51]. However, a poll conducted in 2015 also suggests that 46% of respondents would support bringing together the two systems of the deposit-refund and Plastics Heroes[52].

268 CE Delft – Costs and impacts of a deposit on cans and small bottles in the Netherlands. Update. 2017 [website]

269 CE Delft – Costs and impacts of a deposit on cans and small bottles in the Netherlands. Update. 2017. p. 18 [website]

270 A European Refunding Scheme for Drinks Containers, European Parliament, DG for External Policies, 2011 [document]

271 CE Delft – Costs and impacts of a deposit on cans and small bottles in the Netherlands. Update. 2017. p. 18 [website]

272 Radar – Drie kwart wil statiegeld op flesjes en blikjes (Three quarters want deposit system for bottles and cans). 2016 [website]

273 Revealed by market researcher GfK: Delaying the expansion of the deposit system ignores calls from society and is bad news for the environment, 2018 [website]

274 TNS Nipo – Van statiegeld naar Plastic Heroes hoe groot is het draagvlak hiervoor? (From Deposit system to Plastic Heroes how big is the support for this?). 2017 [document]

THE CASE OF NORWAY

DESCRIPTION OF THE SYSTEM

BACKGROUND FOR INTRODUCING THE SYSTEM

Norway has a long history of deposits as the first system for refillable glass bottles was established back in 1902. In 1974, a tax on beverage packaging was introduced[275]. The following years have been a period of much discussion between the producers and the government in order to convince the authorities to establish a link between performance and the amount of tax which is due[276]. Since 1994, the tax is composed of two elements: a basic tax[277] and an environmental tax which decreases proportionally above 25% return rate. There is a full rebate of the environmental tax if the return rate is above 95%. The reduction is not applied to the basic tax, which remains regardless of the return rate[278]. Prompted by this legislation, in 1996, the beverage producers and retailers decided to establish a company (Norsk Resirk) to handle recyclable cans and plastic bottles through a deposit system. They had an interest in achieving high return rate of empties in order to reduce their environmental levy. The company changed its name to Infinitum in 2014.

LEGAL BASIS, SCOPE, AND TARGETS. LINKS TO OTHER POLICIES OR INSTRUMENTS

Specific regulations of the Ministry of Finance subject non-refillable beverage packaging sold on the Norwegian market both to a fixed basic tax, due for every one-way packaging independent from the return rate, and a variable environmental tax[279].

Table 1: Taxes on non-refillable beverage packaging[280]

	Basic tax	Environmental Tax
Glass and metal	1.19 NOK [0.12 EUR]	5.79 NOK [0.59 EUR]
Plastic		3.44 NOK [0.36 EUR]

275 Government of Norway – The history of green taxes in Norway. 2007 [website]

276 Infinitum – Milestones [website]

277 The basic tax is payable if the packaging cannot be used again in its original form. There are some exemptions from the environmental tax (if packaging is used for beverages in powder form or breast milk substitutes) and from the basic tax (ex. if one-way packaging is used for beverages containing milk, cocoa, or cereal- or soya-based milk substitutes). The Norwegian Tax Administration – Excise duties: Beverage packaging [website]

278 Infinitum – The environmental tax system [website]

279 The rate is set for packaging covered by an approved return scheme. The Norwegian Tax Administration – Excise duties: Beverage packaging [website]

280 The rate is set for packaging covered by an approved return scheme. The Norwegian Tax Administration – Excise duties: Beverage packaging [website]

The size of the environmental tax falls proportionally as the rate of return increases and is not applicable if the return rate is above 95%. The tax applies to wine and spirits, beer and non-alcoholic drinks in primary packaging. Dairy beverages are exempt from the basic tax[281].

Norway is not a member of the EU, but it is a member of the European Free Trade Area (EFTA) and has signed the European Economic Area (EEA) agreement. According to the agreement, Norway has to apply all relevant EU legislation, including the environmental directives[282]. The EU Directive for packaging and packaging waste has been implemented through voluntary agreements between the authorities and the business sector, retaining the targets in the directive[283].

Post-consumer packaging flows in Norway are handled by several operators through different collection systems according to the specific type of packaging. One-way plastic bottles and metal cans for beverages subject to deposit are managed by Infinitum. One-way glass and metal packaging is collected by Syklus/ Sirkel – Norway's oldest material company which ensures that 100% of the glass packaging collected will be materially recycled into new products[284]. Beverage cartons together with cardboard, paper and plastic non-beverage packaging is collected by Grønt Punkt Norge (Green Dot Norway). One-way glass and beverage cartons are not subject to a deposit but are financed through producer fees. Refillable glass and refillable plastic bottles were collected through a system operated by the Norwegian brewers and soft drinks producers named Rentpack. For refillables, the same deposit rates applied as to non-refillable bottles and cans[285] The last refillable glass and plastic bottles were put on the marked in January 2014 and Rentpack closed their business 1 September 2018.

Figure 1: Collection of beverage containers in Norway[286]

System functioning, roles and responsibilities of main stakeholders

The deposit operator

INFINITUM

Founded in 1996 under the name of Norsk Resirk, the deposit operator is owned by the beverage

281 Infinitum – How to join [website]

282 ETC/SCP – Municipal waste management in Norway. European Environment Agency 2013 [report]

283 Norwegian Environmental Agency – Regulations relating to the recycling of waste, Chapter 7 – Packaging waste. [website]

284 Avfall Norge – Syklus, 15 år som hovedsponsor av Avfallskonferansen (Syklus, 15 years as the main sponsor of the Waste conference). 2017 [website]

285 Norden – The Use of Economic Instruments in Nordic Environmental policy 2010 – 2013. Nordic Council of Ministers 2014 [report]

286 Infinitum – Presentation "What is "best in class" deposit return, and how much does it cost producers?" 2016 [presentation]

producers and Norwegian grocery producers. It started operations in 1999. In 2014, it changed its name to Infinitum inspired by the endless number of times bottles and cans can be recycled in the deposit scheme[287].

Infinitum is in charge of administering the DRS for one-way plastic bottles and metal cans, including organisation of collection, transport, and recycling activities.

Producers and importers of beverages in one-way cans or plastic bottles can register their products in the deposit system of Infinitum. They pay a fee to Infinitum to label the packages with the deposit symbol and get the deposit back for all the bottles received back from consumers. The deposit values applicable until recently corresponded to those stated in the Waste Regulations[288] relating to the recycling of waste. In 2018 the decision was taken to raise the deposit values in order to increase return rates even further. Infinitum believes that this would increase the return rate to over 90%[289].

Table 2: Deposit values

Type of container	Beverage cans and plastic bottles	
Volume	< 0.5 l	≥ 0.5 l
Deposit values (until 1 Sept 2018)	1 NOK [0.10 EUR]	2.5 NOK [0.26 EUR]
Deposit values (as of 1 Sept 2018)	2 NOK [0.20 EUR]	3 NOK [0.30 EUR]

Infinitum has three processing plants where the bottles and cans are transported after collection. The biggest is situated near Oslo and is handling approximately 80% of the total collected amounts. The first step in the process is sorting out the aluminium and steel cans. Next the clear and light blue bottles are sorted, followed by the coloured bottles. All separated fractions are then compressed into bales and sent for further recycling[290].

Producers

Producers and importers of beverages sold in one-way plastic bottles or metal cans are not obliged to join the DRS. However, by joining it, they get a reduction on their environmental tax which is equivalent to a full tax exemption, given the high return rates above 95%. If they want to join the system, producers have to follow a set of rules regarding the marking and technical specifications of the containers. To join Infinitum, they have to pay a one-time registration fee for the company and a fee for each new packaged product put on the market. Additionally, producers are required to pay administrative fees to Infinitum.

287 Infinitum – Infinitum's history [website]

288 Norwegian Environmental Agency – Regulations relating to the recycling of waste, Chapter 6 – Take-back systems for beverage packaging. [website]

289 Infinitum – Deposit on cans and bottles doubles [website]

290 Green Visits – Deposit system for beverage packaging [website]

Table 3: Administrative fees paid by producers[291]

Type of material	Metal		Plastic	
	Aluminium	Steel	PET	HDPE
Registration fee (one-time)	10,000 NOK [1,028 EUR]			
Fee for each new packaged product put on the market	2,000 NOK [205 EUR]			
Basic fee per unit	0.00 NOK [0.00 EUR]	0.21NOK [0.021 EUR]	0.18 NOK [0.018 EUR]	0.18 NOK [0.018 EUR]
Additional fee per unit				
If a standard barcode is used and the product is traded also outside Norway	0.03 NOK [0.003 EUR]			
If label covers more than 75% of the packaging	0.03 NOK [0.003 EUR]			
Light blue transparent packaging			0.08 NOK [0.018 EUR]	
Other colour or if label is covering more than 75% of the packaging			0.15 NOK [0.015 EUR]	

Each container must feature a barcode (to be read by the RVM) and a deposit mark (clear symbol for consumers and manual treatment staff). Bottles and cans need to undergo a series of technical testing before market launch to ensure that they are recognised by RVM and can be properly tracked in the system. In addition, there are specific requirements for PET bottles regarding the shape, material, cap, label, and glue, to ensure these will not negatively impact the recycling process[292]. If beverage packaging fails to satisfy applicable requirements, products that have already been shipped to market may not be approved; they may thus not qualify for a fee reduction.

Retailers

All retailers selling beverages bearing a deposit label are obliged to accept back empties. Each retailer or shop needs to register as a collection shop with Infinitum (registration is free), but can decide how to organise the collection on their premises – either with a RVM or as a manual collection point. There are around 3,700 RVM in Norway and 12,000 registered manual points where consumers can return their empty containers[293].

Most retailers have opted for collection via RVM that compress the bottles and cans. In this case, the retailer must enter into an agreement with a machine supplier approved by Infinitum. The RVM reads the barcode on the containers and issues a deposit note to the consumer. The retailers are responsible

291 Infinitum – Cost Calculator [website]

292 Infinitum – How to join [website]

293 Infinitum – 2017 in numbers [website]

for preparing collected packaging for transportation by storing them in specific traceable bags, with barcode and RFID chip, approved by Infinitum[294]. A transporter collects the empties free of charge and sends them to be recycled at an Infinitum production facility. The machine supplier receives the return data and transmits it to Infinitum who issues a clearing statement for the deposited empties and a handling fee. The initial investment for the machines is done by the retailers, but they also receive a larger handling fee from Infinitum because the compression helps reducing transport costs[295].

With manual collection or in case of RVM which do not compress the empties, retailer's staff manually controls the deposit symbol and makes sure that the packaging itself and markings are not damaged before returning the deposit to the consumer. Infinitum does not refund retailers in case the barcode is unreadable or the deposit symbol is missing. The staff fills the drink container into an "Infinitum bag", placing special seals and stickers from Infinitum in order to identify the retailer. A transporter collects the bags free of charge and delivers them to an Infinitum processing facility, where the contents of the bag are counted and a deposit settlement to the retailer is issued based on the count[296].

Table 4: Handling fees reimbursed to retailers according to type of collection and material

Handling fee/ unit	Beverage cans	Plastic bottles
With RVM (compression)[297]	0.2 NOK [0.02 EUR]	0.25 NOK [0.025 EUR]
Without RVM compression or manual[298]	0.05 NOK [0.005 EUR]	0.1 NOK [0.01 EUR]

Consumers

Consumers can return their empty beverage containers and receive their initial deposit back in any of the registered collection points. In addition, they have several other options to give back their empties without the refund.

Infinitum further offers special arrangements for other initiatives to collect bottles and cans, especially for points where large quantities are generated, for instance in schools and sport clubs or during major events such as music festivals[299]. There is a special arrangement between Infinitum and the Norwegian Red Cross to collect empty containers in mountain and hiking areas through more than 1,000 collection points throughout the country. This provides a service to holidaymakers and residents who are far from retailers and other collection points, while also financing Red Cross activities. Under the arrangement, the rescue corps is in charge of deploying the collection containers and informing the local community and they are reimbursed for the collected deposits and a handling fee[300].

A recent project is the partnership between Infinitum and the Norway's largest online grocery store, Kolonial.no. Together, the two companies set up a system that enables the collection of empty bottles and cans directly from households. Customers buy rolls of five 50 l bags, which can be filled with empties. The delivery service collects the bags of empties and brings them back to the Kolonial.no warehouse. From there, the empties are shipped to Infinitum, where they are counted, before the money gets deposited into the customers' account. This is still only covering certain regions but the goal for the future is to expand this system to the whole country[301].

294 Infinitum – Informasjon (Information) [website]

295 Infinitum – Collection points with a reverse vending machine [website]

296 Infinitum – Manual collection [website]

297 Infinitum – Collection points with a reverse vending machine [website]

298 Infinitum – Manual collection [website]

299 Infinitum – Collection schemes [website]

300 Infinitum – The Norwegian Red Cross [website]

Supervision

Recycling numbers are being reported annually to the Norwegian Environment Agency which also approves DRSs. A precondition for the approval is that it achieves a minimum of 25% return rate and that the packaging is subject to environmentally sound recycling. Energy recovery is not allowed or only if justified. The Environment Agency further sets the return rate that the deposit system is expected to achieve. The rate is set in advance for up to one year and serves as a basis for the reduction of the environmental tax[302]. If there need to be any further adjustments, additional payments or refunds, companies have to report it via an online system[303].

301 Infinitum – Annual report 2016 [report]

302 Norwegian Environmental Agency – Regulations relating to the recycling of waste, Chapter 6 – Take-back systems for beverage packaging. [website]

303 The Norwegian Tax Administration – Excise tax return [website]

RESULTS

In 2011, the recycling rate for plastic bottles went above 95% and as a consequence the environmental tax was not applicable anymore. Similarly, in 2012, the 95% threshold was reached for cans. The materials collected via deposit-return deliver the largest share to recycling. In 2016, it represented 86.74% for plastic bottles and 85.10% for cans. The remaining quantities were recycled from waste, including from main sorting, slag sorting, source sorted materials, and utilized energy, amounting to 8.42% for plastic bottles and 12.29% for cans.

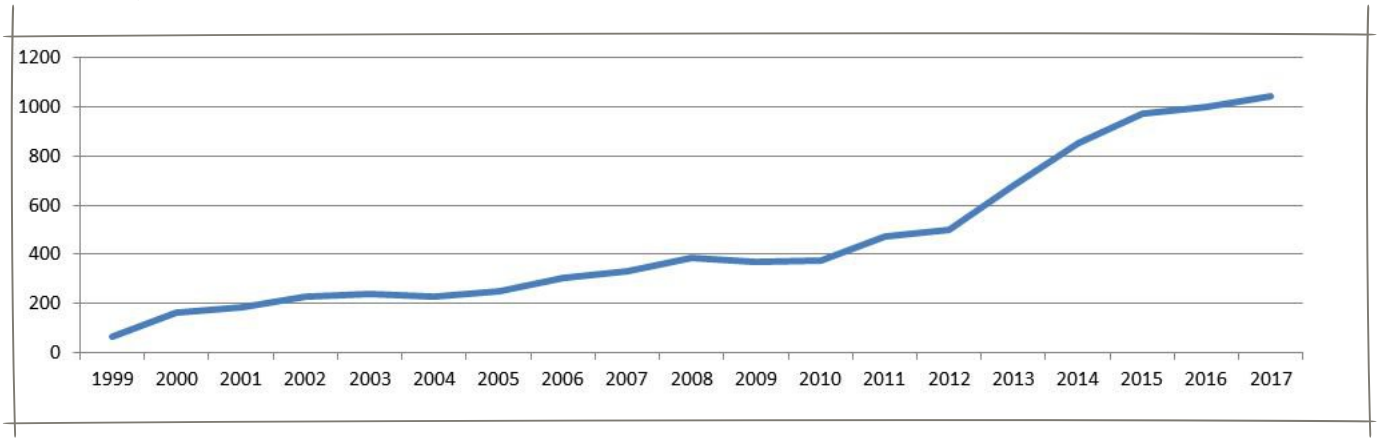

Figure 3: Collection figures 1999-2017 (in millions of units)[304]

There is 100% recycling of the collected materials[305]. As only clear bottles can be recycled back into new bottles, the closed-loop recycling stands at 92% and the rest is recycled into other products. The cans are recycled into aluminium ingots which can be used for new cans or other products.

In 2016, company's total operating revenues amounted to around 1.92 billion NOK [200million EUR], while operating costs were 1.86 billion NOK [194 million EUR].

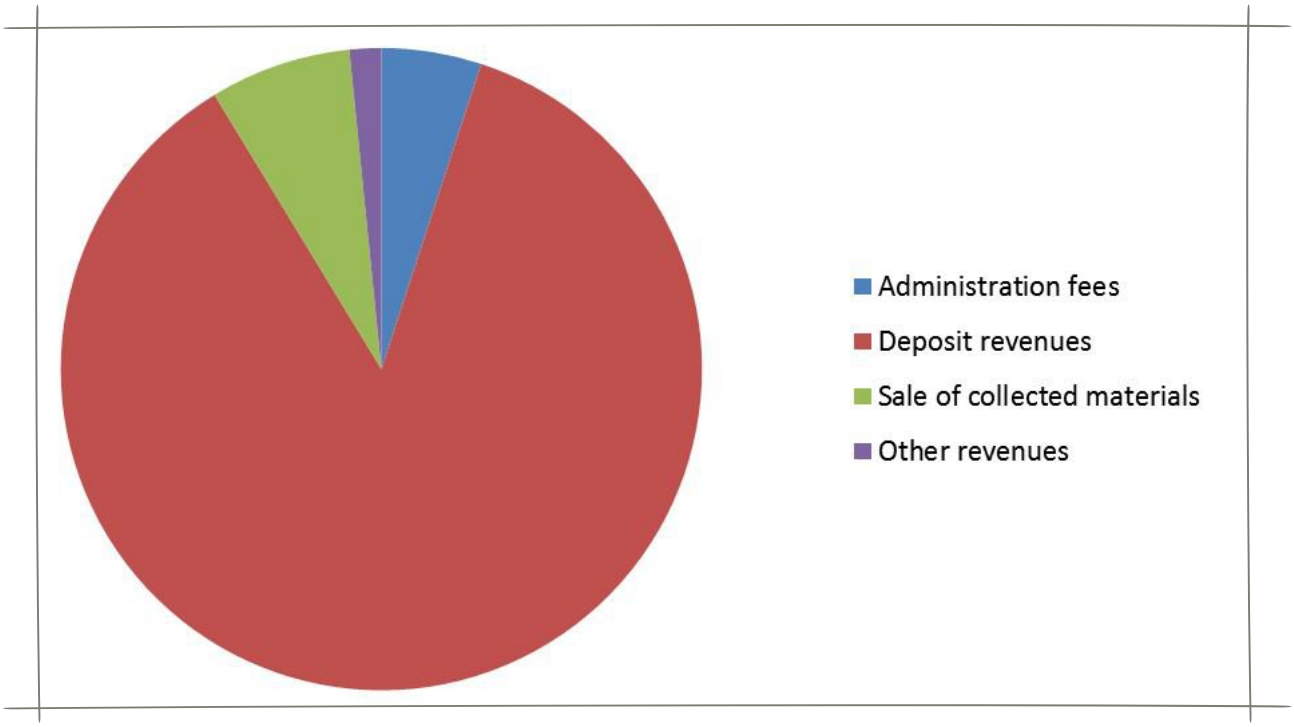

Figure 4: Operating revenues[306]

304 Infinitum – Annual report 2017. [website]

305 Green Visits – Deposit system for beverage packaging [website]

306 Infinitum – Annual report 2017. p. 48 [report]

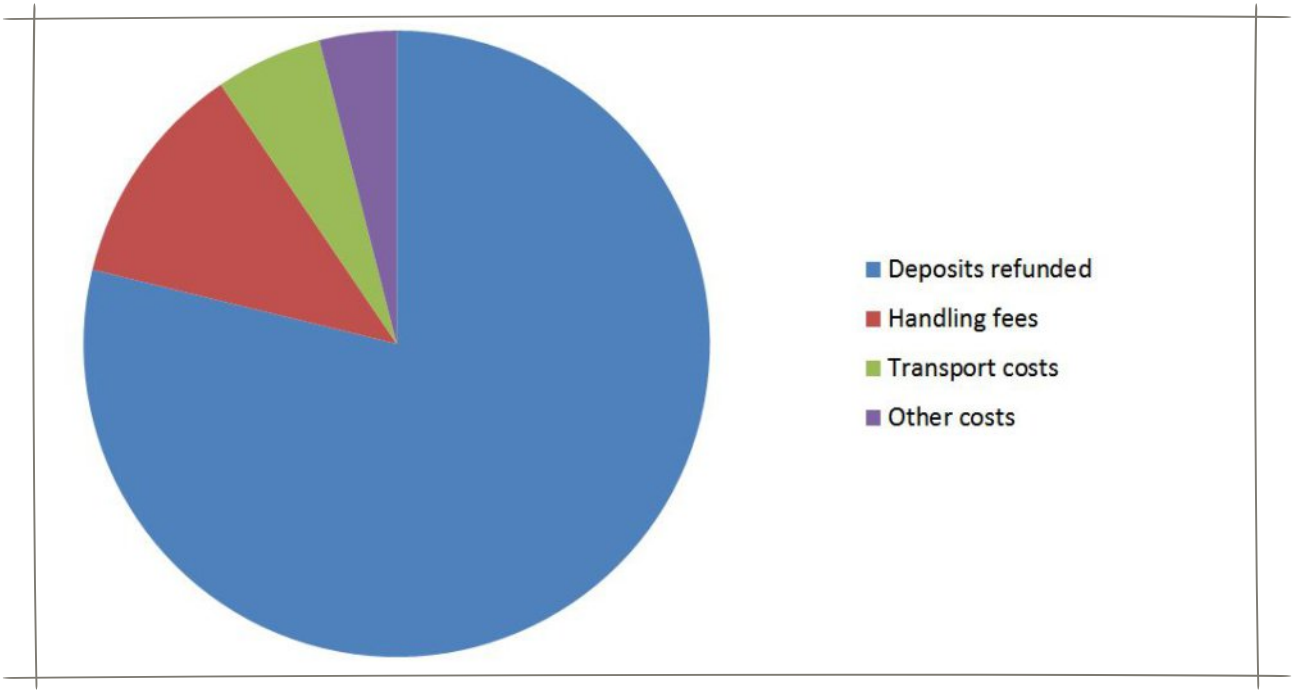

Figure 5: Operating costs[307]

According to the words of Infinitum's Managing Director, in 2016, for the first time, Norwegians stated that considerations for the environment are the most important reason for them to return containers in the deposit system. Surveys show that saved energy and the environment are just as important as the money they get back from the deposit[308].

In 2016, communication campaigns focused on the energy lost if plastic bottles or cans are thrown in the residual waste instead of being returned. This approach was taken since the deposit value is not worth as much to consumers now as it used to be and Infinitum wanted to communicate other advantages of the deposit system. The figures used in this campaign were used from two LCA reports commissioned by Infinitum. Results from survey conducted after the campaign show that consumers were indeed motivated to return their empty containers because of the environment and energy rather than because of the deposit money[309].

307 Infinitum – Annual report 2017. p. 48 [report]

308 Infinitum – Annual report 2017. p. 48 [report]

309 Infinitum – Annual report 2017. p. 48 [report]

THE CASE OF SWEDEN

DESCRIPTION OF THE SYSTEM[310]

BACKGROUND FOR INTRODUCING THE SYSTEM

In the late 1970s, the discussion related to the possible introduction of a mandatory DRS on one-way aluminium cans in Sweden started. This was influenced by the fact that one-way packaging for beverages started to emerge while the use of refillable glass bottles started to decline. There was a strong movement in the society supported by environmental NGOs against one-way beverage containers related to littering problems and decline of the refillable glass system. A deposit system for refillable glass bottles had been introduced long time ago, around 1886-1888, running on a voluntary basis and a number of breweries had established a good distribution and collection networks for refillable glass bottles. The glass bottles in this system were standardised. The breweries were therefore unwilling to lose their market advantage with the introduction of one-way containers and were also supporting the movement against one-way beverage containers.

The industry initially strongly opposed the mandatory DRS but eventually had no other choice than to establish such a system. The following played a particular role: (1) societal pressure; (2) failure to achieve the recycling rate of 75% indicated by the government through voluntary collection trials; and (3) demonstrations projects showcasing that the collection would not create perceived hygienic issues. Therefore, in 1982, the industry created an organisation called Returpack as the operator of the DRS. Firstly, the DRS applied to aluminium cans (started 1984) and 10 years later (in 1994), it was expanded to PET bottles.

LEGAL BASIS, SCOPE AND TARGETS. LINKS TO OTHER POLICIES OR INSTRUMENTS

Currently, the main piece of legislation concerning deposit-return for aluminium cans and PET bottles is the Ordinance on return system for plastic bottles and metal cans[311]. It states that all parties professionally serving or importing drinks ready for consumption in plastic bottles or metal cans must ensure that the product is included in an approved deposit-return system. The original legislation had a narrower definition for the materials subject to DRS – “aluminium” and “polyethylene terephthalate”

310 Tojo, N. – Deposit Refund Systems in Sweden. International Institute for Industrial Environmental Economics. Lund University. 2011 [report].

311 Regulation 2005:220 – Förordning om retursystem för plastflaskor och metallburkar (SFS 2005:220) (Regulation on return systems for plastic bottles and metal cans) 2005 [website]

(PET). The current law applies a broader definition – packaging made of "metal" and "primarily of polymer material" in order to reflect the development of new materials for beverage containers and current practices on the market.

The deposit requirement does not apply to drinks that contain 50% or more dairy products or vegetable, fruit or berry juice – these are registered with the approved national compliance scheme for household packaging Förpacknings & Tidnings Insamlingen (FTI). Since 2015 syrup[312] manufacturers and since 2018 juice[313] manufacturers can also voluntarily join the Returpak system. New logistic solutions have been introduced and the facilities are being adapted to the new flows[314].

Table 1 : Type of packaging used for different beverage categories (in % of volume)[315]

Packaging data 2016	Can	PET	Refillable glass	Others*
Beverages with alcohol	65.14	1.61	7.95	25.3
Carbonated soft drinks	19.92	64.72	1.53	13.83
Other soft drinks	22.43	40.42	0	37.15
Bottled water	14.19	74.19	11.27	0.35
Total beverages sold in this type of packaging	35.91	41.84	5.09	17.15

* includes one-way glass, tanks, cartons and "bag-in-box" packaging types

The Ordinance on producer responsibility for packaging[316] defines a minimum recycling rate of 90% for beverage packaging which falls under a DRS. No sanctions are foreseen in the legislation in case the targets are not reached.

The original legislation[317] includes a mandate for DRS for PET bottles with a recycling rate of 90% regardless of whether they are refillable or one-way. Therefore, a system for refillable PET bottles was organised separately from the system for one-way PET, but it ended in 2008. Today, there are no refillable PET bottles or cans in Sweden. An additional DRS for refillable glass bottles exists – breweries/fillers themselves are responsible for organising the system for refillable containers.

Beverage cartons are excluded from the deposit system and are instead collected as part of the paper packaging collection system operated by the packaging PRO (FTI)[318].

312 Syrups ("saft" in Swedish) are concentrated fruit or berry drinks mixed with water

313 Juice drinks with a fruit contain over 50%

314 Returpack – Historia (History) [website]

315 Sveriges Bryggerier – Fördelning på förpackningstyper (Distribution on packaging types) 2016 [website]

316 Regulation (2014:1073) – Förordning om producentansvar för förpackningar (2014:1073) (Regulation on producer responsibility for packaging) [website]

317 Act (1991:336) – Lag om vissa dryckesförpackningar (SFS 1991:336) (Act on certain beverage containers) [website]

318 Förpackagings & Tidnings Insamlingen – Paper Packaging [website]

System functioning, roles and responsibilities of main stakeholders

Deposit operator

Returpack was created in 1982 to operate the DRS for aluminium cans which started in 1984. Later, the legislation introduced similar requirement for PET bottles and the Returpack integrated these in the already existing system. Each material has its own accounting and no cross-financing between the two takes place.

Returpack is the only existing return system approved by the Swedish government. It is a privately-owned company operating on a non-for-profit basis. Its current owners[319] consist of representatives from the brewery sectors (50%) and retailer associations[320] equally shared between large (25%) and small/individual retailers (25%).

Returpack organises the overall activities needed for the DRS for one-way metal cans and plastic bottles, in coordination with a number of actors. It collects deposits and administration fees from producers and pays back to retailers the deposits for the beverage containers returned by consumers, as well as handling fees as compensation. The empty cans and bottles are brought to depots (intermediate collection facilities) and then transported to facilities run by Returpack. The metal cans are baled together and sold to smelters abroad. The smelters sell back metal roll sheets to the can manufacturer in Sweden. The PET bottles are sorted into coloured and non-coloured and are baled. The bales are delivered to a PET recycling facility located close by[321].

A total turnover of the company was 2.7 billion SEK (266 million EUR) in 2017[322]. The composition of the revenues is split in a fairly even way between administration and sorting fees, material sales and unredeemed deposits, each accounting for approximately 1/3 of total revenues.

Producers

Every manufacturer or importer of beverages in cans or plastic bottles is obliged under legislation to include their product in an approved DRS. In order to be part of the system, obliged parties have to pay an affiliation fee[323] of 10,000 SEK [985 EUR] (which goes directly to the Swedish Board of Agriculture) and to pass a credit-worthiness check with Returpack. The latter includes registration of each product and sending samples of the packaging. The packaging has to comply with defined technical specifications (concerning material, thickness, colour, contents, shape, and barcode legibility) to ensure that the containers will function throughout the entire recycling system – from collection to the manufacturing of new bottles or cans. Any packaging joining the system has to be clearly marked in accordance with Returpack's marking instructions (e.g. barcodes, deposit marks). All planned changes to already registered products must first be communicated and approved by Returpack. For each packaging marked with a company's barcode, the manufacturers and importers have to pay a deposit and applicable fees (administration fee and sorting fee) to Returpack.

319 Initially Returpack was owned by a large aluminium can manufacturer (48%), breweries (48%) and retailers (4%).

320 Sveriges Bryggerier – the Swedish Brewers Association, Livsmedelshandlarna – the Association of small and individual retailers and Svensk Dagligvaruhandel – the Association of large retail chains

321 The recycling facility of Cleanaway has been cooperating with Returpack since 2006-2007.

322 PANTALERA – Ägare och ledning (Owner and management) [website]

323 Producers of fruit juices which are not obliged to join the system, but can do so voluntarily as of 2015, are exempt from the affiliation fee. PANTAMERA – Anslut er till pantsystemet (Answering to the mortage system) [website]

Table 2: Deposit, sorting and administration fees paid by producers[324] (sorting and administration fees are VAT excl.)

	Aluminium can	Steel can	Clear PET bottle		Coloured PET bottle	
			<= 1 l	> 1 l	<= 1 l	> 1 l
Deposit (VAT included)	1 SEK [0.10 EUR]	1 SEK [0.10 EUR]	1 SEK [0.10 EUR]	2 SEK [0.20 EUR]	1 SEK [0.10 EUR]	2 SEK [0.20 EUR]
Sorting fee		0.25 SEK [0.02 EUR]			0.05 SEK [0.005 EUR]	0.05 SEK [0.005 EUR]
Adminis-tration fee			0.22 SEK [0.02 EUR]	0.52 SEK [0.05 EUR]	0.22 SEK [0.02 EUR]	0.52 SEK [0.05 EUR]

The deposit paid will be refunded by the consumer purchasing the beverage. Manufacturers and importers also have to report to Returpack their sales per barcode (i.e. amount of respective packaging sold and level of deposit) on a monthly basis[325].

Retailers

Retailers are not obliged to take back empty beverage containers. They can voluntarily join the system for free and as Returpack customers are entitled to receive a compensation of both the deposit and a handling fee for the additional costs incurred because of the deposit management (RVM, servicing, staff, space, material).

There are 14,000 such collection points (including supermarkets, small cafés, restaurants, sport clubs, airports, etc.) and 95% of the collected volume is done at food retail markets. Containers returned by consumers to the shops are collected by Returpack-approved vehicles and vessels and brought to Returpack facilities. Retailers which have registered as customers can either be equipped with their own RVM (around 3,000 customers) or can do the necessary operations manually. There are two options for retailers using RVM: (1) 94% of the shops have their collected containers picked up loose by a dual compartment truck operated by Returpack; (2) shops in more isolated locations (countryside or islands) have their containers collected in approved bags/ cardboard boxes which are then picked up by their wholesalers/ beverage suppliers and delivered to a facility operated by Returpack[326]. In 2017, 96% of the total quantities were collected via RVM (including the bulk-collection version called Pantamera express).

In all cases, the containers delivered to Returpack must be sorted – i.e. plastic bottles must be separated from metal cans in order to get reimbursed for the deposit fee. The RVM sort this automatically. The quality of materials is also important – any glass or other impurity can result in the compensations not being paid out[327]. Collection and transport from the shops is paid for by Returpack.

324 PANTAMERA – Returpack – Appendix 3 Deposit and fees [Appendix]

325 PANTAMERA – Returpack – Breweries and importers [website]

326 PANTAMERA – Returpack – Shops [website]

327 PANTAMERA – Returpack – Customers and Partners [website]

Table 3: Handling fees in 2018[328] (indicated amounts are excluding. VAT of 25%)

	RVM (picked up loose)	RVM (in bag/ cardboard box)	Manual collection
PET bottle ≤ 1 l	0.258 SEK/unit [0.024 EUR/unit]	0.316 SEK/unit [0.03 EUR/unit]	0.2 SEK/unit [0.019 EUR/unit]
PET bottle > 1 l	0.345 SEK/unit [0.033 EUR/unit]	0.503 SEK/unit [0.048 EUR/unit]	0.2 SEK/unit [0.019 EUR/unit]
Metal can	0.174 SEK/unit [0.016 EUR/unit]	0.190 SEK/unit [0.018 EUR/unit]	0 SEK/unit [0 EUR/unit]
Fixed compensation	20,000 SEK/year [1,926.19 EUR/year]	20,000 SEK/year [1,926.19 EUR/year]	

The recycling system means that a deposit is attached to beverage packaging put on the market and it follows the packaging at all stages of the journey from the manufacturer or importer and the retailer to the consumer. The consumer returns empty packaging to the retailer, whereupon the retailer controls that the packaging is part of the recycling system and returns the deposit to the consumer. The control is mainly carried out by means of registering and counting the packaging in RVMs with the help of the barcode, whereupon the retailer gathers and delivers the packaging to the collecting party in containers approved by Returpack. For such mechanically counted packaging Returpack reimburses the retailer for the deposit and provides additional handling compensation on the basis of the reading of RVMs in accordance with an agreement between Returpack and the retailer. In turn, the collecting party also debits Returpack a collecting fee based on the number of containers with material that the respective collecting party has delivered for recycling in accordance with an agreement between Returpack and the collecting party. Returpack receives money when selling cans/bottles to smelters/ recycling plants.

Consumers

When buying a beverage packed in a metal can or plastic bottle, consumers see the deposit they have to pay printed on the packaging itself and on the receipt they receive at the cashier. When returning the cans/ bottles to an automated machine, consumers receive a ticket with the amount which is to be refunded to them at the retail. Alternatively, they can choose to donate the money to a charity instead.

Figure 1: Pantamera Express

In addition to returning empty packaging in stores, consumers can use a deposit return bank (Pantamera Express) to dispose of their empty bottles and cans. Bags filled with cans and PET bottles (up to 100 units) can be emptied in a compartment of the station. Customers can choose to receive a payment: through a check that can be used in a grocery store or through a bank/PayPal transfer. Alternatively, they can decide to donate the deposit amount to a charity. The Pantamera Express are located at recycling centres across Sweden. In 2018, there are 30 such machines[329].

328 PANTAMERA – Returpack – Hanteringsersättning 2018 (Handling remuneration 2018) [report]

329 PANTAMERA – Pantamera Express [website]

Additionally, Returpack uses a mobile collection station (Pant-o-Bil) to facilitate the collection of cans and bottles in festivals. Similarly to Pantamera Express, by returning their packaging to Pant-o-Bil, consumers can choose how to receive the deposit back in the form of a check to be used in a grocery store or through a bank/PayPal account[330]. For larger music festivals, Returpack has developed other solutions by offering large-scale operations to handle all packaging with deposit generated at the festival.

Figure 2: Pant-o-bil

Figure 3 : Pantamera Tube

Furthermore, Returpack offers to municipalities to establish Pantamera "tube" – an additional bin placed next to a public waste bin. The aim is to encourage consumers to place their empty cans and bottles separately instead of throwing them away in a general waste bin, and to allow others who are willing, to pick them up and return them to a collection point where a deposit can be received[331].

Lastly, Returpack offers non-for-profit organisations to collect bags filled with cans and bottles and receive a flat rate of 200 SEK [19.7 EUR] per bag. To do so, an NGO has to register with Returpack. Upon registration it receives a set of bags and labels suited for collected bottles and cans. Once a bag is filled, the participating organisation has to leave it at a designated collection point from which Returpack picks up the bags. A flat rate payment is made if the bags are filled correctly: (1) cans and Pet bottles cannot be mixed in one bag; (2) bags have to be filled completely. Imported or damaged cans are also accepted through this system[332].

Supervision

The Swedish Board of Agriculture[333] is the supervisory authority and the Swedish Environmental Protection Agency[334] is responsible for the official statistics. The affiliation fee paid by producers goes entirely to the Board of Agriculture to finance inspections in retail stores. The authority can hand out fines to shops that sell beverage products without deposit[335].

330 PANTAMERA – Idag rullar Pant-o-bilen in I Linköping (Today, Pant-o-car rolls into Linköping) [website]

331 PANTAMERA – Hälften av landets kommuner har pantrör – nu erbjuder Pantamera alla kommuner att testa (Half of the country's municipalities have shelter pipes - Pantamera now offers all municipalities to test). 2018 [website]

332 PANTAMERA – Så går det till (That is how it goes) [website]

333 Jordbruksverket – Home [website]

334 Naturvårdsverket – Home [website]

335 Jordbruksverket - Recycling system for plastic bottles and metal cans [website]

RESULTS

The introduction of the DRS for both metal cans and PET bottles led to a sharp increase of source separation for these products. Since 2000, the recycling rate for metal cans has varied between 85% and 93%. In 2016 it was 86.2%[336]. This represents a decrease of 5 percentage points from the previous year and the first time in five years that the 90% recycling target had not been met. The decrease is influenced by the change of calculation methods[337]. In 2017, the recycling rate for metal cans reached 85.7% and for plastic bottles 84.1%[338]. The return rate of containers has been high but not reaching the 90% prescribed by the law. Since the introduction of the DRS for cans, the amount of the deposit has been increased twice leading to increases in the collection rate. There was no similar change for PET bottles, where lower return rates are recorded in particular for smaller bottles.

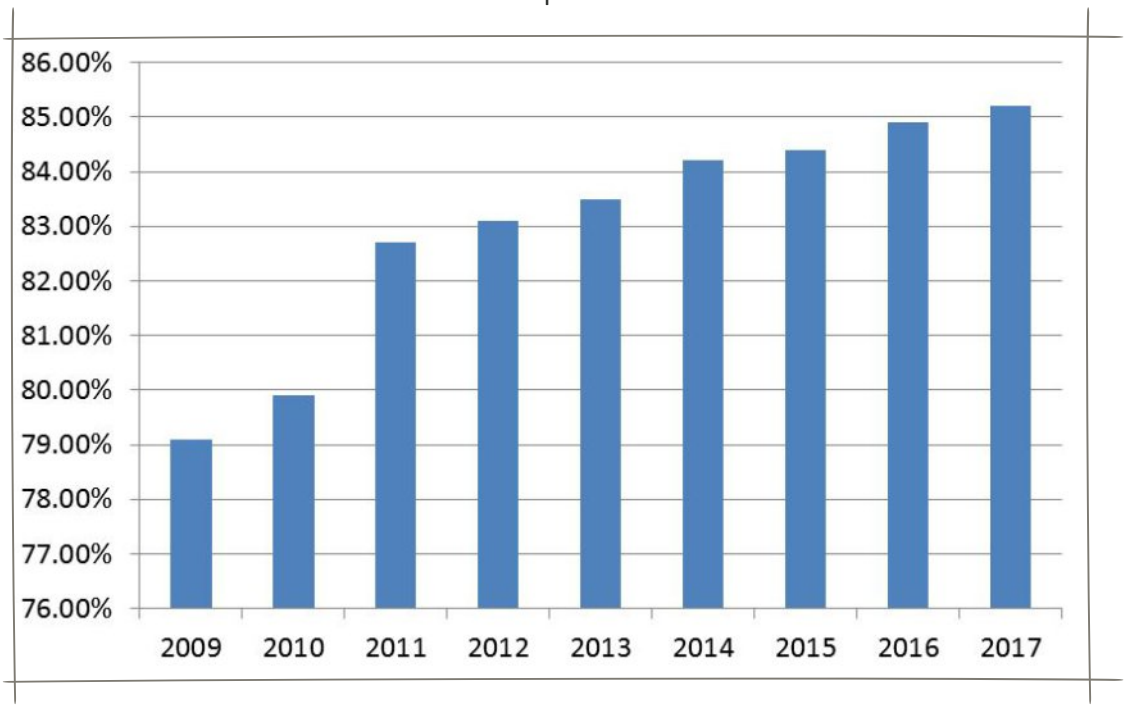

Figure 4: Recycling rates for bottles and cans collected through the Returpack system

The DRS for metal cans allows to “close the loop” for this material. Regarding PET bottles, only the clear ones can be processed into food grade. Since around 80% of the PET bottles put on the market are clear and 20% are coloured, on average about 70% of the PET collected by Returpack is used directly for the manufacturing of new PET bottles, the rest is going into other applications[339].

The DRS for one-way beverage containers is generally well accepted by different stakeholders, both nationally and internationally. The Swedish consumers had already sorting habits due to the fact that the return system for glass bottles had been long established and well-functioning since decades, the introduction of the system for one-way beverage containers was therefore well received by the wider public. This is further enhanced by several aspects of consumer convenience of the system – for instance, the fact that retailers act as collection points and, therefore, consumers can return containers and do their shopping at the same time, as well as the fact that retailers accept empty containers even if those were originally purchased at a different store.

336 Returpack – Pantstatistik (Deposit statistics) [website]

337 Naturvårdsverket – Resultat av producentansvaret (Producer responsibility results) [website]

338 Returpack – Pantstatistik (Deposit statistics) [website] and Naturvårdsverket – Sveriges Återvinning av Förpackningar och Tidningar. Uppföljning av producentansvar för förpackningar och tidningar 2017 (Sweden's Recycling of Packaging and Newspapers. Follow-up of producer responsibility for packaging and newspapers) [report]

339 Cleanaway – The URRC process [website]

SYNTHESIS

TIMING AND BACKGROUND FOR INTRODUCING THE SYSTEM

Closely linked with local production of beverages (milk, beer) and the exclusive use of refillable glass bottles, the practice of returning bottles has been established in many European countries long before one-way beverage containers appeared. Refillable bottles were heavy, durable and suitable for reuse up to 20 times –therefore too valuable to be discarded straight away. This is why the beverage producers were interested in running a functional deposit system for such bottles, typically on a voluntary basis and not on a legal mandate[340]. In particular since the 1960-1970s this situation began to change conditioned by several major trends, including the consolidation of the bottling industry, increase of transport distances, rise of consumerism and the importance of consumer convenience. One-way cans (made out of steel and later aluminium), followed by (PET) plastic bottles became increasingly popular, progressively taking over the market share of refillables. Deposit systems for these one-way containers started to appear around the world.

In Europe, Iceland was the first country with a legislation setting up a deposit system on a national scale for a wide range of beverage containers – in 1989 it had introduced the system for non-refillable metal, plastic and glass packaging. Already before that – in 1984 Sweden was the first country to introduce a DRS with a more restricted scope (only on one-way metal cans). Later on, Sweden expanded the system to cover also plastic bottles in 1994. This triggered action also in neighbouring countries. They took a different and more restrictive approach to addressing the issue – high taxes in Finland and Norway and ban in Denmark. A second "wave" of DRS introduction took place in the 2000s when a DRS began operating in Germany, Netherlands, Estonia and Croatia. Lithuania was the latest country to introduce a DRS in 2016.

At this point in time, several other countries or regions have taken the decision to implement such a system either with a concrete planning or within a timescale still under discussion. Other countries have considered introducing a DRS in the past, performing analyses and studies, but have eventually opted for focusing efforts on optimising existing separate collection systems, often in collaboration with the national PRO and through voluntary approaches.

Austria[341]

Recently, the discussion of DRS has surged in Austria (Salzburg), triggered by increased littering and share of one-way glass and plastic bottles at the expense of refillables.

340 Organisation for economic Cooperation and Development (OECD) – Addressing the Economics of Waste. 2004 [website]

341 Land Salzburg – Littering an der Salzachböschung (Littering on the Salzach embankment) 2018 [website]

Salzburg.ORF.at – Flaschen, Dosen: Experten fordern Pfandsystemand (Bottles, cans: experts demand a deposit system) 2018 [website]

Belgium[342]

Investigation on possible introduction of a DRS and political discussions are taking place in all three Belgian regions. In Brussels-Capital Region and in Wallonia, separate pilot projects are launched or are under discussion on the initiative of the regional governments in collaboration with the national packaging PRO. In summer 2018 the Flemish Government reached a compromise agreement: the packaging sector will be asked to introduce a compulsory DRS if the targets for waste and litter are not achieved by 2023.

England[343]

The UK government has confirmed it will introduce a DRS in England for one-way drinks containers (whether plastic, glass or metal), subject to consultation later in 2018. It will look at the details of how such a scheme would work, alongside other measures to increase recycling rates.

France[344]

In the framework of the Action Plan on Circular Economy from 2018 the options for an introduction of a DRS are under study. A special interest is given to a deposit for refillable bottles and for "consignes solidaires" [supportive deposits] which create incentives for the collection of bottles to be used for financing environmental, health-related or social causes.

Latvia[345]

In October 2018 the Latvian Parliament supported the introduction of a packaging deposit system for beverages, to be introduced in 2020 for plastic and glass bottles and metal cans. The Cabinet has been tasked to come up with a detailed plan for the introduction of the system.

Malta[346]

In 2015 the Government highlighted its intention to introduce a DRS in the country, which it confirmed during the EU "Our Oceans conference" in 2017. The scheme is expected to be put in place by the end of 2019.

342 Parliament of the Brussels-Capital Region – Compte rendu integral des interpellations et des questions /Integraal verslag van de interpellaties en de vragen / Commission de l'Environnement et de l'Énergie, chargée de la Conservation de la nature, de la Politique de l'eau et de la Propreté publique /Commissie voor het Leefmilieu en de Energie, belast met het Natuurbehoud, het Waterbeleid en de Openbare Netheid . 2018 [document];

Walloon Government – PROPRETÉ PUBLIQUE - REPRISE DES CANETTES ABANDONNEES DANS LA NATURE - Voici les 24 communes qui participeront au projet-pilote (PUBLIC CLEANING - RESUMPTION OF CANETTES ABANDONED IN THE NATURE - Here are the 24 municipalities that will participate in the pilot project). 2018 [website]; and

Flemish Government – Ongeveer 28 zoekresultaten (About 28 search results). 2018 [website]

343 UK Government (2018) – Deposit return scheme in fight against plastic. Press release. 2018 [website]

344 Ministry of Ecological and Solidarity Transition of the Republic of France – 50 mesures pour une économie 100% circulaire (50 measures for a 100% circular economy). 2018 [report]

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346 Ministry for the Enviornment, Sustainable Development and Climate Change of the Republic of Malta – Beverage Container Refund Scheme. 2018 [website]

Portugal[347]

After the country received a notification from the European Commission regarding a risk of failing to meet the 50% recycling target for household waste by 2020, the Portuguese Government have taken several actions in tis regard. Among those, at the end of December 2018, a law was passed that will introduce a DRS in the country after 2021. It would apply to plastic, glass and metal beverage containers which are non-reusable. In the meantime, by the end of 2019, a pilot project will be implemented as an incentive scheme for the return of non-reusable plastic beverage packaging.

Romania[348]

In summer 2018 the Government of Romania adopted an ordinance on packaging waste management that aiming to increase the recycling rate. One of the measures included is to introduce a deposit fee for reusable packaging starting from 31 March 2019. As of 31 March 2022, the deposit system will be expanded to include also non-reusable packaging of certain types of drinks.

Scotland[349]

In the 2017/2018 programme, the Government committed to develop a DRS implemented across Scotland designed to increase recycling rates and reduce littering. As part of the process, a public consultation and a national roadshow were running in the summer of 2018. The Scottish Government will now analyse the responses received to help shape elements of scheme design in the months ahead.

Slovakia[350]

Following studies performed by the Institute of Environmental Policy (IEP) running under the Environment Ministry, the Government is working on introducing a DRS for plastic bottles and cans with setting up of an internal working group and start of negotiations with retailers and producers, aiming to be the first country in Central Europe to introduce such a system.

Spain[351]

Several autonomous regions are considering the introduction of DRS, among which Catalonia, Navarra, Valencia. They have performed several studies to examine the economic, environmental and social viability of such a system for the regions.

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Most countries introduced the DRS for one-way bottles when refillable containers were either still very common or were quite common in the past. Consequently, it can be expected that consumers were already familiar with the basic functioning of such a system and had the habit to return their "empties" to the stores, while the stores/retail in turn had established procedures and facilities for accepting containers. Generally, a (long) history of systems for refillable bottles appears to act in favour of a smooth transition to deposit systems for one-way bottles and the acceptance of the general public.

In most countries (Finland, Sweden, The Netherlands, Estonia, Island, Croatia, Denmark) the DRS was established before[352] the container-based collection system for general household packaging governed by Producer Responsibility Organisations (PROs) or managed by municipalities. There is no arrangement where the deposit-subject and no-deposit-subject packaging are managed by the same organisation. Since the two systems are separate and operate in parallel, this has important implications in terms of investment and infrastructure costs. In countries where the DRS comes after, (more or less) comprehensive packaging collection based on containers or kerbside infrastructure is already established, with associated investment costs by the producers already incurred. In such cases the producers are more reluctant to the idea of investing further money to set up a DRS as an additional system. Additionally, from the total of packaging waste, drink containers are the materials which are most economically interesting and taking them out from the existing collection system would reduce revenues and tonnages while the infrastructure, and to some extent related handling costs, would remain the same, at least in the short term. Despite the strong arguments put forward by producers, no targeted or comprehensive study to estimate the effects of one system on the other has been identified.

The positive participation of producers seems decisive in determining the success of the system. In cases where this has not been the case and where industry opposition has been particularly strong (in Germany and The Netherlands), this has compromised the smooth functioning of the system.

REASON AND MOTIVATION FOR INTRODUCTION

Two main reasons have motivated the decision to introduce a DRS in the countries: it is seen as an effective instrument to increase recycling rates; and to address the problem of littering and stimulate more environmentally-conscious consumer behaviour. Interestingly enough, while the main drivers are usually clearly articulated from the beginning as official arguments, there seem to be no consistent follow-up and track of these two aspects.

Regarding recycling rates, these are monitored as part of the overall packaging recycling targets. However, comparison over time is often difficult because there are no records of recycling rates per individual container type subject to deposit – these are often aggregated by material or by type.

In some countries (Germany, Denmark), the DRS has been introduced as a reaction to the decline of refillables with the main objective to keep their share on the market. Nonetheless, the decline of refillables and rise in one-way containers is a general trend observed in all countries – with or without DRS. Practicality, costs, globalisation and marketing are among the general reasons behind this trend, and so far no rigorous evidence exists to confirm an actual link or substitution between refillable and one-way packaging.

352 In Estonia both were established at the same time; in Denmark there is no mandatory EPR on packaging and therefore no systematic financing of separate collection by the packaging producers – this is responsibility of local authorities, but without an obligation for separate collection. With the new obligations stemming from the revised EU legislation on waste (mandating EPR for packaging for all EU Member States by 2025), this situation might change in the future.

In all countries except of Norway and Island, a DRS for refillable bottles exists as a separate system, operated by producers (fillers) themselves. The involvement of the DRS operator for one-way containers in the system for refillables varies from non-existent in most cases to defined information management in the case of Denmark or operational support in the case of Finland.

LEGAL BASIS, TARGETS AND SCOPE

All countries have put in place a legal framework to regulate the system. Where this framework has not been clear or comprehensive enough, there have been significant disturbances in the subsequent functioning of the system. This has been the case in Germany where the initial legislation lacked clear obligations for producers and retailers resulting in an "island solution" situation where retailers declined to accept empty packaging different from their product portfolio. The Netherlands is the only country where the DRS is based on a voluntary agreement between government and producers, although a provision is included in the legislation but it is not enacted.

Few countries have included specific recycling targets for the DRS and have instead general targets for packaging, as a transposition of the EU Packaging Waste Directive. In the countries where such targets exist, they are set at a high rate of 90% (Finland, Sweden, and Lithuania (as of 2020)).

Most of the systems are comprehensive: in 7 out of the 10 analysed countries they cover all three types of one-way packaging materials: plastic, metal and glass. The exceptions are Sweden and Norway (DRS only for plastic and metal) and the Netherlands (only PET bottles). The reason for not including glass in Sweden can be traced back in time: for a long time refillable glass bottles dominated the market while one-way glass were not very common, their number is quite limited still today and they are not seen as posing major issues in terms of littering which was one of the main reasons for the introducing the DRS. The situation seems to have developed in a similar way also in Norway. In the Netherlands, the system is based on a voluntary agreement between the government and the producers, and since the very beginning the discussions have focused on plastic bottles rather than any other material. In practice it only covers PET bottles.

Most countries have very vast scope of container coverage also in terms of volume: either all (Finland, Norway, Sweden, Iceland) or a wide range between 0.1 l to 3 l (in Denmark, the upper limit is 20l ; it is 10l in case of plastic containers for non-carbonated water. In Croatia the lower limit is 0.2l). The scope in the Netherlands is uncommon since in practice it applies to plastic containers above 0.75 l only.

In terms of beverages covered, the legislative texts commonly include a list of those beverages which are included in the scope of the DRS and of those which are excluded. Most commonly exceptions are in place for beverages fully or partly containing dairy, vegetable or fruit juices. The official arguments are related to the higher hygiene requirements that such containers would need and to the associated implications in terms of logistics, organisation and costs. However, in some instances the system was adapted to accept part of those (in Sweden on a voluntary basis) or will be adapted to accept them in the future (in Denmark – mandatory since 2020).

In some DRS are tightly linked to other policies and instruments, creating additional incentives for involved stakeholders. For instance, in Norway, producers are not obliged to join the DRS, however, they have strong incentives to do so because of an environmental tax which decreases proportionally to the return rate and to the fact that the DRS achieves very high return rates which allow producers to be exempted from the environmental tax.

SETUP AND FUNCTIONING OF THE SYSTEM

The systems differ from a country to another; however, they commonly have several main features:

- The producer who places a packaged beverage on the market registers with the DRS operator. The registration usually includes a financial contribution from the producer in the form of "affiliation fee" and product-specific fee. Further, the registration includes a physical check of the product and the inclusion of specific elements (barcode, logo) to ensure that it will be recognised by the system and the consumers. At this stage the DRS operator also usually collects deposit fees. (1)

- The producer sells the container to his "customer" i.e. the retailer, charging the deposit on top of the sale price. (2)

- The retailer passes the deposit over to the final consumer. The final consumer can claim this deposit back once she/he brings back the empty packaging to a collection point, usually operated by the retailer. (3)

- The retailer who has collected the packaging needs to repay the deposit back to the consumer. Usually the retailer hands over the collected material to the DRS operator and receives in turn an equivalent amount of deposit fees (paid initially by producers), as well as some reimbursement in the form of "handling fees" for the additional effort related to the handling of deposit packaging. (4)

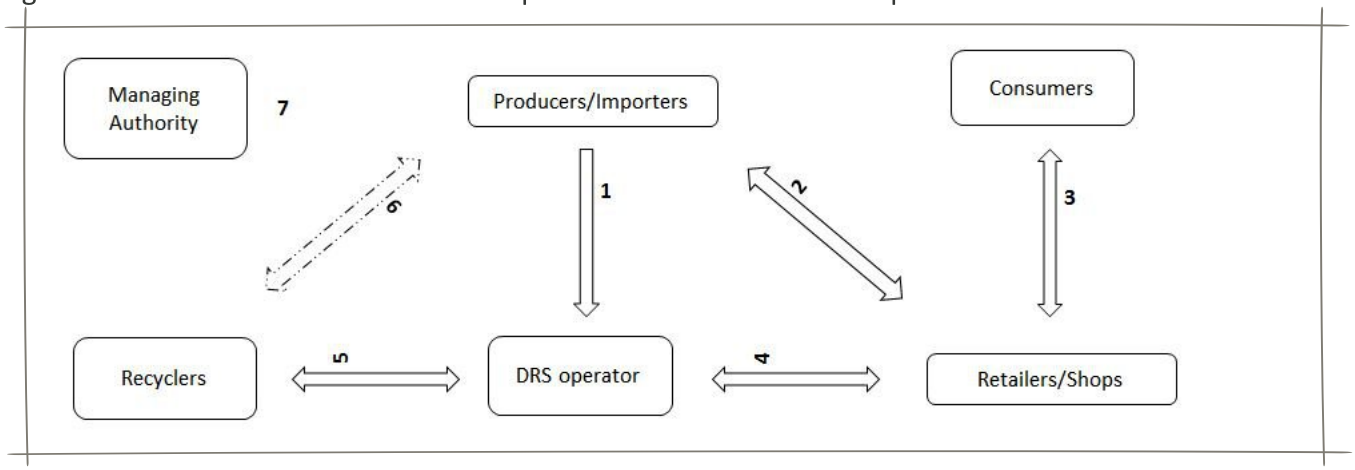
- The DRS operator manages the collected containers by organising their transport, sorting and processing through contracts with waste management operators and recyclers. (5)

- (Part of the) recycled materials goes back to the producers to be used for packaging again. (6)

- In principle, there is also a managing authority to which producers are accountable and to which they provide information, either directly or through the DRS operator. (7)

The DRS operator acts as a central element to the system, streamlining flows of materials, information and money. It functions as a "clearing house" to adjust the imbalances that may result when deposits and materials move from one actor of the system to another. In terms of financial balance, three sources of revenues are most common: revenues from sale of collected materials to recyclers, specific producer fees or "administrative fees", and unredeemed deposits. The expenses are related to payment of "handling fees" to retailers, the transport of collected containers and related processing operations, such as sorting and counting and counting of containers, and common administrative costs.

While sharing several key elements in common, each DRS has its specificities due to the individual context or distinct development over time. In particular, differences between the DRS can be found with regards to the allocation of roles and responsibilities of the different parties involved.



In each country, there is only one DRS operator. It is industry-run in all countries except Croatia, where it is a public authority, and Iceland, where it is mixed public-private governance model. The DRS operators function on a non-for-profit basis meaning that their revenues are supposed to be equal to the incurred costs, and extra revenues should be reinvested in the operation of the system. The ownership is commonly divided equally among producers and retailers. In some countries (Germany and the Netherlands in particular), some retail chains operate own DRS separately from the central system.

In most countries the DRS operator performs all functions related to the flow of materials, information and money. Denmark is the "extreme" case as all operations and infrastructure are owned and managed in-house by the DRS operator itself. In other cases like Finland, the DRS operator is still in charge of all operations and logistics but outsources everything, owning only an administrative office and no physical infrastructure. The situation is different in Germany, where the activities of the DRS operator are limited to providing a central database for deposit clearing which is undertaken by the producers and retailers themselves.

Collection and counting from consumers can be performed either manually or automatically using RVMs. RVMs and the related technological infrastructures favour wide coverage and consumer convenience and thus appear central to many systems, in particular those with high recycling rates. They are usually managed and financed by retailers themselves, with reimbursement from the DRS operator. Iceland is an exception since the retailers do not have obligations and are not involved in the system – the collection is performed by the DRS operator, run both by the state and the producers, and takes place at own return facilities. In addition to the common collection points, the DRS operators have introduced innovative collection methods: for instance mobile collection points, deposit banks accepting containers in bulk, deposit shelves attached to public waste bins, partnership with associations and the NGO sector. These were set up especially in recent years and appear to be a reaction to high, but stagnating collection rates.

The level of the deposit is between 0.10 EUR and 0.25 EUR. The lowest rate is applied in Croatia – it is 0.06 EUR for all materials and sizes. In some cases it is mandated by the law, but more often it is determined by the DRS operator (in consultation with Government and/ or concerned parties). The amount has remained stable in many countries since the introduction. However, in some such as Norway, it has been increased in 2018 with the objective to further increase the collection and recycling rates.

In all cases, there are requirements that the deposit is visible through clear markings in order to be easily identifiable by the consumer. It is usually combined with a barcode allowing the technical identification of the container (reading through scanners or RVMs).

The systems are usually supervised by the National Ministry of the Environment or the Environmental Protection Agency. In Estonia, there is a specially created Advisory Body – the Packaging Committee – which gathers together a wide range of stakeholders from the public and private spheres, and monitors the activities of all PROs. Often, the exact monitoring; sanction and enforcement powers of the supervising bodies are often not clear enough.

SYSTEM RESULTS

Generally, the systems achieve high results in terms of collection and recycling rates with reported recycling rates being in the range of 80-90% and higher. While all collected materials are sent for recycling, the degree of closed-loop recycling i.e. the integration of materials in the same type of products varies. For the moment, it is more advanced for glass and metals than it is for plastics where the applications are much wider. In some cases, the supervision is not rigorous enough and there is a feeling of certain lack of transparency. For instance in Germany, major retail chains are operating own systems in parallel to the central DRS, with little interaction between them, and the overall rates are based on estimations.

The reliability of reported rates is exacerbated in cases where cross-border movement of deposit-bearing containers is an issue. For instance, it is estimated that important amount of deposit-bearing cans are imported from Germany to Denmark (600-700 million cans each year). However, they are ending neither in the German deposit-refund collection system (because they are exported and not returned back), nor in the Danish on (because they do not bear the Danish deposit but only the German one). A German-Danish agreement is therefore under discussion to address this issue by establishing a cross-border DRS where customers can choose which deposit to pay depending on the country where they will return the empty container. Such an agreement could be interesting for other Nordic countries as well. However, in order to be implemented in practice, complex adjustments will need to be realised. The situation is similar in the Baltic countries – with the difference that Estonia and Lithuania both have a DRS, but Latvia, which is situated between the two, does not. Linked to the decision to raise the tax on alcohol in Estonia, it is estimated that up to 25% of alcoholic beverages are brought from Latvia to Estonia for personal use. Since these lack the markings specific to the Estonian DRS, they are not eligible for a refund and a proportion ends in residual waste, not being separated for recycling. A solution to coordinate with Latvia would again imply intricate arrangements.

Generally, in order to be accepted in the system, containers undergo a preliminary check and approval process, where it is ensured that they contain a number of elements (logo and barcodes), as well as comply with specified standards in terms of material content and design. This seems important to ensure the material is suitable for high-quality recycling later on since any impurity will not only inflict on the possibility to recycle the actual beverage container, but can contaminate the whole batch. The DRS has thus a potential indirect impact on the design of packaging which so far has not been explicitly put forward.

Information regarding the economic aspects of the systems is generally scarce. In cases where it is available, it is usually not complete and not specific enough. Thus it does not allow making meaningful comparisons.

Country	Economic aspects
Croatia	Total revenue: 70.5 million EUR; Total costs: 65 million EUR This is for all packaging waste managed by the DRS operator. Numbers for deposit packaging only are not available.
Denmark	Total turnover: 252.34 million EUR Of which Deposit turnover: 188 million EUR; Total revenue: 67.13 million EUR

Estonia	Total revenue: 33.8 million EUR
Finland	Total costs : 70 million EUR; Deposit turnover: 300 million EUR
Germany	n/a
Island	Total value of exports of collected materials: 1.74 million EUR
Lithuania	Total income: 23.86 million EUR
	Of which: unredeemed deposit – 4.053 million EUR; fees collected from producers – 13.23 million EUR; income from sold material – 6.58 million EUR; Total costs: 23.016 million EUR Of which: collection – 19.38 million EUR (of which compensation for retailers – 16.24 million EUR and transportation costs – 3.14 million EUR); counting centre operation costs – 3.64 million EUR.
The Netherlands	n/a
Norway	Total revenues: 186 million EUR
Sweden	Total turnover: 266 million EUR

Some ad-hoc survey and personal observations seem to suggest a reduction over time of deposit-bearing packaging in littering. Similarly, surveys conducted in some countries show general support of consumers for DRS. However, no explicit studies have been performed to scientifically and independently confirm the subjective perceptions.

CONCLUDING REMARKS

The current study tries to give as much as possible clear factual data and key elements that "decision-makers" should bear in mind when considering to implement DRS. On the basis of the information gathered for each of the ten countries which have already implemented a DRS on national level in Europe, the following concluding remarks can be formulated:

- Context is crucial

Waste management situation is different from a country to another and influenced by many factors. EPR schemes are not functioning always in the same way in all EU member states and do not procure the same results. Therefore, the relevance of a DRS should be assessed depending on the performances of the existing EPR scheme and other relevant factors. DRS should not be seen as a "silver bullet" solution for waste problems. Decision-makers need to have a clear and realistic approach, which includes a clear comprehension on what EPR/DRS can and cannot do and what should be complemented by other policy options and appropriate instruments. It is also very important to take into account the "whole picture" – waste management framework but also cultural/ historic specificities and particular market forces.

Economic incentives are effective in terms of consumer behaviour but they do not act in isolation and other aspects (such as consumer convenience) need to be addressed as well. More information is necessary to be able to make a decision as available information is not enough and it is only applicable to a specific context. A one-to-one transfer of experiences does not seem to be a correct approach. If a territory starts considering the implementation of a DRS, it has to perform thorough analysis of its own local context and get additional information, involving all relevant parties in the process.

- Context is dynamic and evolving

DRS commonly achieve high collection and recycling rates and tend to oscillate around these over time. At the same time, economic, legislative and societal contexts evolve, pushing for further results and more ambition. So far, many existing DRS have extended their scope and operation methods over time to respond to such changes (for instance by developing innovative collection methods or rolling out extensive communication campaigns).

With the concept of circular economy gaining ground, the drive for higher results is expected to continue in the future and DRS will need to keep up. Balance needs to be found between having a robust and comprehensive legal framework and enough flexibility which would allow adapting to changing conditions.

- Context is not isolated, a wider approach is needed

Experiences show that a system in one country potentially has an impact on others as well. Most prominently, cross-border shopping has proven to be a big issue in countries with differing market conditions. Part of the collection and recycling potential of deposit-bearing containers is lost because consumers are buying them in one country – where economic incentives for their recovery are in place – but are disposing of them in another country where the incentives might not be that strong.

With the current increased interest in DRS and risk of fragmentation of the internal market it could be useful to have a more coordinated approach between countries. In the framework of EU legislation, specific guidance has been provided to support member states in the implementation of policy instruments and the achievement of higher results. Maybe in the future member states would benefit from EU guidance on DRS as well, taking account of one-way beverage containers, but also refillables and the rest of packaging.

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This country report is based on publicly available information gathered by ACR+ team and validated by a Public waste management operator.

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