European Deposit Systems as a Cost-efficient Tool for High Quality Recycling of Beverage Containers

Anna Larsson, Director, Reloop Europe
High Collection Rates and Food Grade Quality

Deposit systems for beverage containers comply with high collection targets as well as high quality recyclate.

In some countries, thanks to deposit systems, loop of PET is already closed.

The operators of the deposit systems allow the packaging specifications that ensure most optimal recycling for the purposes of closed loop recycling. The containers in deposit systems are eco-designed for food grade quality which ensures high sales prices securing lower producers’ fees. Applying of eco-modulation motivates producers to use packaging material which maximizes recycling yields.

In Sweden and Norway, the PET loop is closed on the country level.

The collection rates of the beverage packaging subject to the deposit system are over 85%. This is why many countries have already implemented the deposit system. Also, the Single Use Plastic Directive recommends deposit schemes to tackle the challenge of the plastic pollution.

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Recycle Content and Reduced Carbon Footprint

EU requirements:

Beverage bottles must be made from 25% recycled rPET by 2025, and 30% in 2030 recycled plastic – all kinds.

Bevcons from plastic should be separately collected:
- 77% by 2025
- 90% by 2029

Values in rectangles represent the % of the recycling content. Draft is elaborated based on the LCA of beverage container production, collection and treatment systems; Østfoldforskning

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Deposit Systems in Europe – Current Development

Deposit return systems implemented, under implementation and discussed

- Norway (1999)
- Iceland (1989)
- Denmark (2002)
- Scotland (2022)
- England (2023/24)
- Netherlands (2005)
- Germany (2003)
- Portugal (2022)
- Malta (2020)
- Sweden (1984)
- Finland (1996)
- Estonia (2005)
- Lithuania (2016)
- Latvia (2022)
- Belarus (2020)
- Slovakia (2022)
- Romania (2022)
- Croatia (2006)
- Turkey (2023)
# Standard European Deposit System

<table>
<thead>
<tr>
<th>Centralized clearing</th>
<th>Island</th>
<th>Croatia</th>
<th>Sweden</th>
<th>Norway</th>
<th>Finland</th>
<th>Lithuania</th>
<th>Estonia</th>
<th>Denmark</th>
<th>Netherlands</th>
<th>Germany</th>
<th>Decentralized</th>
</tr>
</thead>
<tbody>
<tr>
<td>System management by producers</td>
<td>Island</td>
<td>Netherlands</td>
<td>Sweden</td>
<td>Norway</td>
<td>Finland</td>
<td>Lithuania</td>
<td>Estonia</td>
<td>Denmark</td>
<td>Croatia</td>
<td>Germany</td>
<td>Decentralized</td>
</tr>
<tr>
<td>Return to retail</td>
<td>Germany</td>
<td>Croatia</td>
<td>Sweden</td>
<td>Norway</td>
<td>Finland</td>
<td>Lithuania</td>
<td>Estonia</td>
<td>Denmark</td>
<td>Netherlands</td>
<td>Island</td>
<td>Redemption center</td>
</tr>
<tr>
<td>Bar code</td>
<td>Island</td>
<td>Germany</td>
<td>Sweden</td>
<td>Norway</td>
<td>Finland</td>
<td>Lithuania</td>
<td>Estonia</td>
<td>Denmark</td>
<td>Netherlands</td>
<td>Croatia</td>
<td>Tonnage</td>
</tr>
<tr>
<td>Obligatory by law</td>
<td>Island</td>
<td>Germany</td>
<td>Sweden</td>
<td>Croatia</td>
<td>Netherlands</td>
<td>Lithuania</td>
<td>Estonia</td>
<td>Denmark</td>
<td>Finland</td>
<td>Norway</td>
<td>Fee</td>
</tr>
</tbody>
</table>

1 upon public procurement
2 reporting on put to market and information on collected packages are based on EAN code identification
3 in border areas
4 fee for uncollected packaging (Norway) or fee applied if the producer has not joined the deposit system (Finland)
### Upcoming Deposit Systems in Europe

#### Centralized clearing
- Slovakia
- Latvia
- Malta
- Scotland

#### System management by producers
- Slovakia
- Latvia
- Malta
- Scotland

#### Return to retail
- Slovakia
- Latvia
- Malta
- Scotland

#### Bar code
- Slovakia
- Latvia
- Malta
- Scotland

#### Obligatory by law
- Slovakia
- Latvia
- Malta
- Scotland

**Return to retail**

Return to retail model is a **standard in Europe** and this model secures highest convenience for the citizens and lowest possible carbon footprint from the collection of the containers. The choice of the shops subject to the obligation is determined by the retail structure in an individual country.
Source of information on carbon footprint of the deposit systems:
Norway: LCA of beverage container production, collection and treatment systems, Østfoldforsking;
Czech Republic: Life cycle assessment study on the treatment of plastic and aluminum packaging for beverages, Faculty of Environmental Technology, UCT Prague

Collection points Photo Reloop
Shops bigger than 200m² (Estonia), 300m² (Lithuania)
# Packaging Scope

<table>
<thead>
<tr>
<th>Country</th>
<th>Plastic</th>
<th>Metal</th>
<th>Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croatia</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Denmark</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Estonia</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Finland</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Germany</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Island</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Lithuania</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Netherlands</td>
<td>●</td>
<td>From 2022</td>
<td>●</td>
</tr>
<tr>
<td>Norway</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Sweden</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
### Products’ Scope

<table>
<thead>
<tr>
<th></th>
<th>Croatia</th>
<th>Denmark</th>
<th>Estonia</th>
<th>Finland</th>
<th>Germany</th>
<th>Island</th>
<th>Lithuania</th>
<th>Netherlands</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>water (still, sparkling)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>soft drinks</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>juices and nectars</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>beer</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>cider</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>alcohol beverages</td>
<td>●</td>
<td>&lt;10%</td>
<td>&lt;6%</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>wines</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>in PET</td>
<td>●</td>
<td>in PET</td>
</tr>
<tr>
<td>liqueurs</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>spirits</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>milk</td>
<td>&lt;0,2l</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Interestingly, in Sweden, although juices are not subject to the obligatory DRS, more and more producers decide to include juice products into the scheme on voluntarily basis. Multilayer package is exchanged by a PET bottle as the DRS has become a synonym of reliable recycling.
The operational cost of the deposit system is covered by the system operator and includes:

- Handling fees (for the collection service performed by the retailers)
- Transport and logistics
- Administration and marketing

Updated handling fees can be found here:


DRS operator’s incomes include:

- Sales of recyclables (recyclables are the ownership of the system operator)
- Unredeemed deposit
- Put to market fees
Producers and importers cover the investment and operational costs of the deposit system. The investment cost for the producers include:

- The establishment of the deposit operator entity,
- The counting/logistics centres,
- PR campaigns proceeding the start-up of the deposit system

RVMs are normally not subject to the investment of the system operator. The system operator covers the investment cost later on via the handling fee – compensation for the collected bevcons (per unit basis/ differentiated: automated/manual)

RVMs are placed in the retail locations through:

1. Purchase by the individual retailers/retail chains
2. Procurement of the collection service per retail chain
3. Procurement of the collection service by the system operator (see Lithuania)

Option 2 and 3 implies capex of the technology provider compensated through the handling fees
DRS Costs in Comparison with Other Collection Schemes

Deposit systems for beverage containers comply with **high collection targets** and reduce littering.

<table>
<thead>
<tr>
<th>Country</th>
<th>PRO</th>
<th>NOK/kg</th>
<th>Collection rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway - DRS</td>
<td>INFINITUM</td>
<td>2,8</td>
<td><strong>89.4%</strong> (2019)</td>
</tr>
<tr>
<td>Austria – non DRS</td>
<td>Ara</td>
<td>6,95</td>
<td>Plastic 33.6%/ PET70% (2019)</td>
</tr>
<tr>
<td>Belgium – non DRS</td>
<td>Fost Plus</td>
<td>2,46 PET 3,58 HDPE 7,11 Other plastic</td>
<td><strong>46%</strong> (2019)</td>
</tr>
<tr>
<td>Sweden (plastic packaging outside DRS)</td>
<td>FTI</td>
<td>3,26-4,91</td>
<td><strong>40%</strong> (2019)</td>
</tr>
<tr>
<td>Netherlands – non DRS</td>
<td>Avfalfonds Verpakkingen</td>
<td>3,60-6,00</td>
<td><strong>52%</strong> (2018)</td>
</tr>
<tr>
<td>Spain – non DRS</td>
<td>EcoEmbes</td>
<td>4,33 PET 3,77 HDPE 7,39 other</td>
<td><strong>37%</strong> (2017)</td>
</tr>
<tr>
<td>Italy – non DRS</td>
<td>Conai</td>
<td>2,08-3,69</td>
<td>Plastic <strong>45.5%/PET55%</strong> (2018)</td>
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The DRS cost in Norway is **2,8 NOK per 1 kg PET** (2020) (collection rate 89,4% for 2019)

EPR fees for plastic packaging in chosen European countries; 2020  
**Before intensification, litter clean up and plastic tax embedded** into the fees !!!

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