Implementation of Circular Economy Principles through DRS

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Green Deal

Cricular economy preconditions:

1) Maximized collection
2) Good quality material
3) Recycled content
4) Low carbon foot print
5) Local implementation
6) Cost efficiency

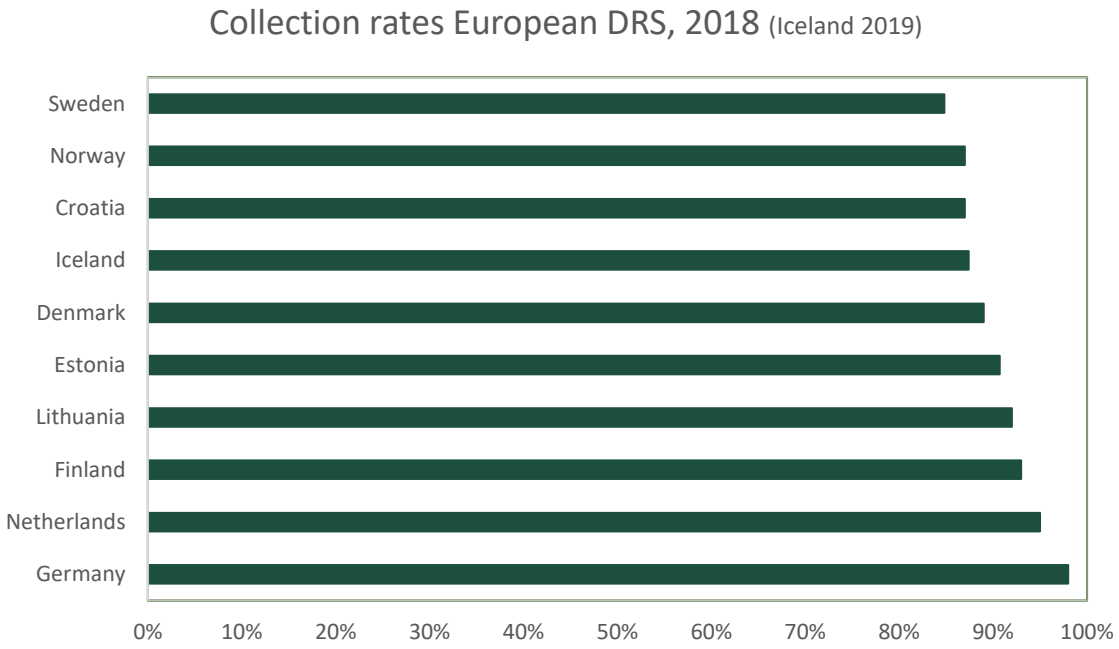
Collection rates

Collection rates

Collection rates resulting from CE Package	by 2025	by 2030
Packaging, in total	65%	70%
Plastic packaging	50%	55%
Wood	25%	30%
Steel	70%	80%
Aluminium	50%	60%
Glass	70%	75%
Paper & carboard	75%	85%
Colletion rates resulting from SUPD	by 2025	by 2029
Beverage plastic packaging	77%	90%

High collection rates and food grade quality

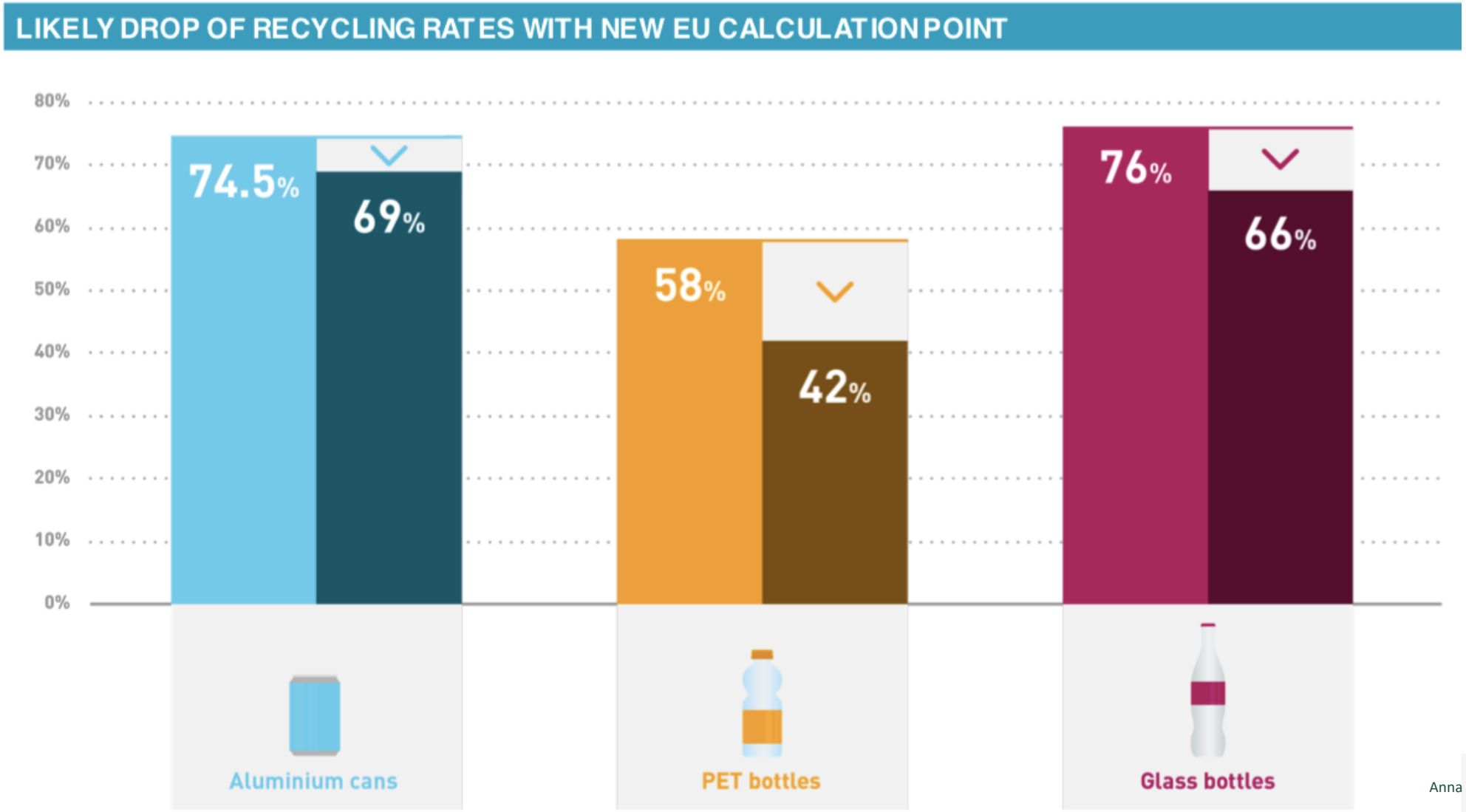
Deposit systems for beverage containers comply with **high collection targets** as well as high **quality recyclate.**



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.

Lithuania:
Y1 – 74%
Y2 – 92%
Y3 – 92%
Y4 – 92%

New measurement point



”What shall we do..?” – Recycled content

	By 2025	By 2030
Bevcons in PET	Min. 25%	
Bevcons in plastic		Min. 30%

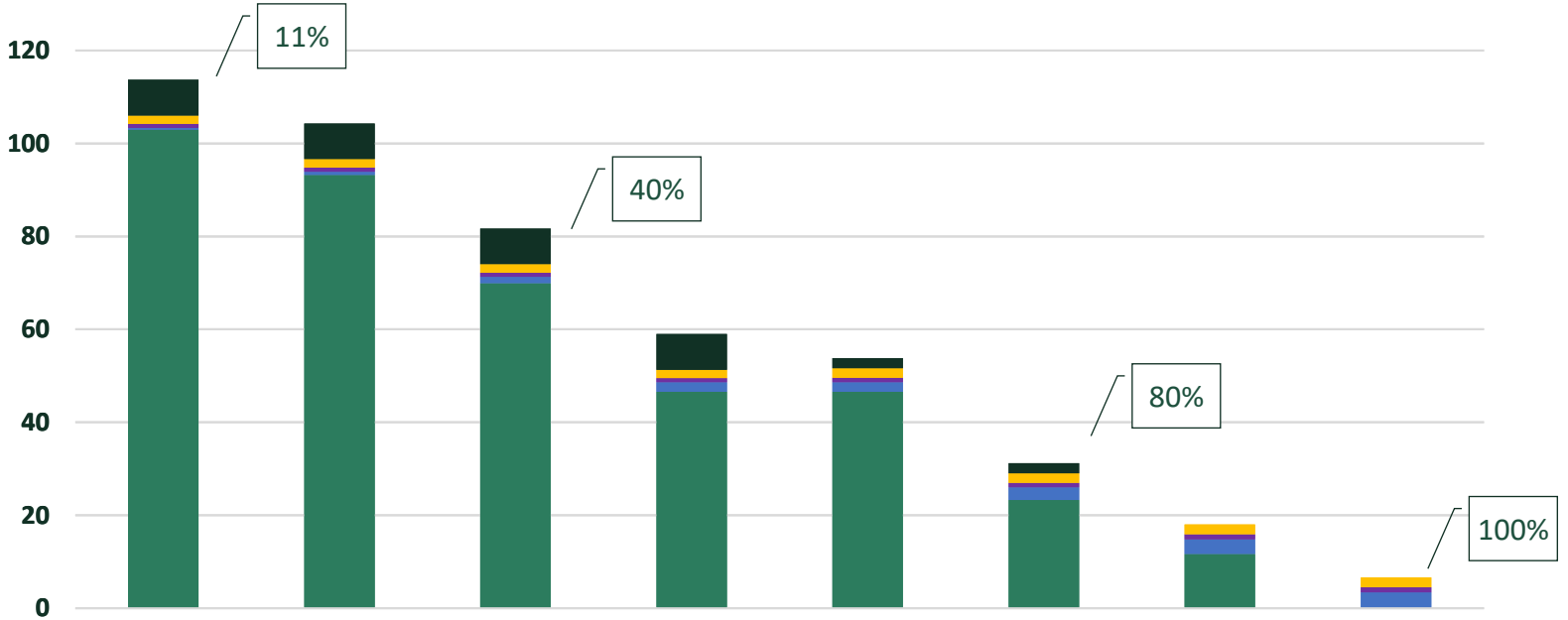
In DRS, 80% rPET is guaranteed as of today;

In Sweden and Norway rPET stays in local markets

Demand in recycled content

- **Proctor & Gamble** – Goal to have 99% of all hair care bottles sold in Europe converted to include 25% post-consumed recycled content by the end of 2018
- **Danone / Evian –** Announced that it will make all of its plastic bottles from **100% recycled plastic** by 2025
- **Ecover –** Has set a goal to use **100% recycled plastic in all bottles** by 2020 and to introduce recycled content into its caps from 2018
- **Nestle –** Goal to increase its use of recycled plastics, including the use of 25% rPET in its bottles across Europe by 2025
- **Coca Cola –** Goal to have 50% recycled content in its packaging by 2030
- **Unilever –** Goal to increase use of recycled plastic content in its packaging to at least 25% by 2025 (compared to 2015)
- **Werner & Mertz –** Has committed to use **100% recycled plastic** in at least 70 million bottles/year as of 2017

Recycle content and its impact on carbon footprint



	Collection rate 87%, rPET 11%	Collection rate 87%, rPET 20%	Collection rate 87%, rPET 40%	Collection rate 87%, rPET 60%	Collection rate 95%, rPET 60%	Collection rate 95%, rPET 80%	Collection rate 100%, rPET 90%	Collection rate 100%, rPET 100%
Incineration (incl. Transport)	7,7	7,7	7,7	7,7	2,2	2,2	0,0	0,0
Transport from consumers to recycling	1,8	1,8	1,8	1,8	2,0	2,0	2,1	2,1
Reverse vending machine	0,9	0,9	0,9	0,9	1,0	1,0	1,1	1,1
rPET in preform	0,4	0,7	0,7	2,0	2,0	2,7	3,1	3,4
vPET in preform	102,9	93,2	93,2	46,6	46,6	23,3	11,7	0,0
Total	113,8	104,4	81,7	59,1	53,9	31,3	17,9	6,6

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*

Eco design

Essential requirements

6 MATERIAL SPECIFICATION

Clear PET bottle

YES

Bottle
- PET

Colour
- clear
- transparent light blue

Closure
- HDPE
- PP

Seals, valves
- PE
- EVA

Barrier
- monolayer

Coatings, additives
- Glaskin
- Bestpet

Label, sleever*
- OPP
- PP
- PE
- PET
- paper

Label glue
- water or alkali soluble (label detaches when washed at +65°C)

NO

Bottle
- PP
- PE
- PLA

Closure
- PS
- PVC
- metal
- thermoset

Seals, valves
- metal
- PCV
- silicon

Barrier
- multilayer

Coatings, additives
- all

Label, sleever*
- OPS
- PVC
- metallised materials
- heavy metal printing inks

Label glue
- hotmelt

*If sleever label cover used
≤ 40% of bottle surface area – transparent bottle recycling fee
> 40% of bottle surface area – coloured bottle recycling fee

Coloured PET bottle

YES

Bottle
- PET

Colour
- transparent colours

Closure
- HDPE
- PP
- PET

Seals, valves
- PE
- EVA

Barrier
- monolayer
- multilayer without tie layers

Coatings, additives
- Glaskin
- Bestpet

Label, sleever*
- OPP
- PP
- PE
- PET
- paper

Label glue
- water or alkali soluble (label detaches when washed at +65°C)

NO

Bottle
- PP
- PE
- PLA

Colour
- metal colours

Closure
- PS
- PVC
- metal
- thermoset

Seals, valves
- metal
- PCV
- silicon

Barrier
- multilayer with tie layers

Coatings, additives
- all

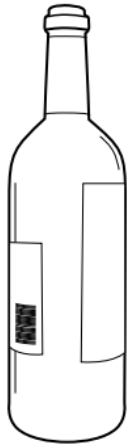
Label, sleever*
- PVC
- metallised materials
- heavy metal printing inks

Label glue
- hotmelt

7 MATERIAL SPECIFICATION

YES

- Aluminium, plastic and natural cork closure
- Flip-top closure (plastic)
- Metal foiling
- Glass materials of various colours
- Glued, adhesive, sleever and PSL labels
- Campaign, security and RFID stickers



NO

- Flip-top closure (porcelain) and lead closure
- Painted glass bottle
- Opal and lead glass
- Ceramic material
- Fixed basket, bag or plastic coating
- Metal ring or seal
- Bottle shape not suitable for reverse vending machine processing

Source: PALPA

Modulated fees

EPR COST PRODUCER/IMPORTER

01.10.2018	Aluminium	Steel	PET	HDPE
Basis EPR	–0,08 Nkr	0,21 Nkr	0,10 Nkr	0,10 Nkr
Standard kode	0,06 Nkr	0,06 Nkr	0,06 Nkr	0,06 Nkr
Light blue			0,08 Nkr	0,08 Nkr
Colored or sleeve > 75 %			0,15 Nkr	0,15 Nkr
Sleeve eller label	0,03 Nkr	0,03 Nkr		

Source: INFINITUM

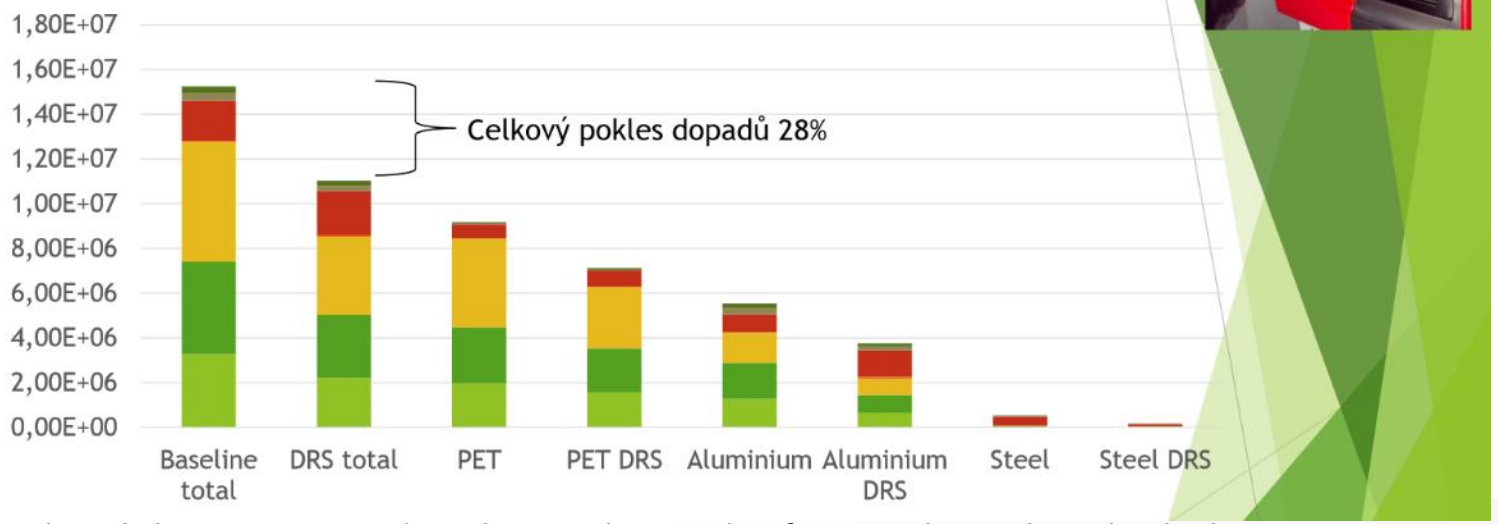
Environmental performance

CO_2

	Infinitum system, Main transport model (86 % collection rate)	Infinitum system, Infinitum's transport model (86 % collection rate)	GPN system (70 % collection rate)	GPN system (50 % collection rate)	Incineration scenario (93 % incineration)
Incineration (incl. Transport)	7,70	7,70	18,83	32,98	69,47
Transport from consumers to recycling	1,81	0,59	3,38	2,42	0,00
Reverse vending machine	0,94	0,94	0,00	0,00	0,00
Total	10,45	9,23	22,21	35,39	69,47

FAKULTA TECHNOLOGIE OCHRANY PROSTŘEDÍ VŠCHT PRAHA

Srovnání nezálohového a zálohového systému



Collection of beverage containers through deposit system results with ca 30% lower carbon foot print than traditional curbside system. Source: LCA for existing deposit system in Norway and LCA calculated for Czech Republic

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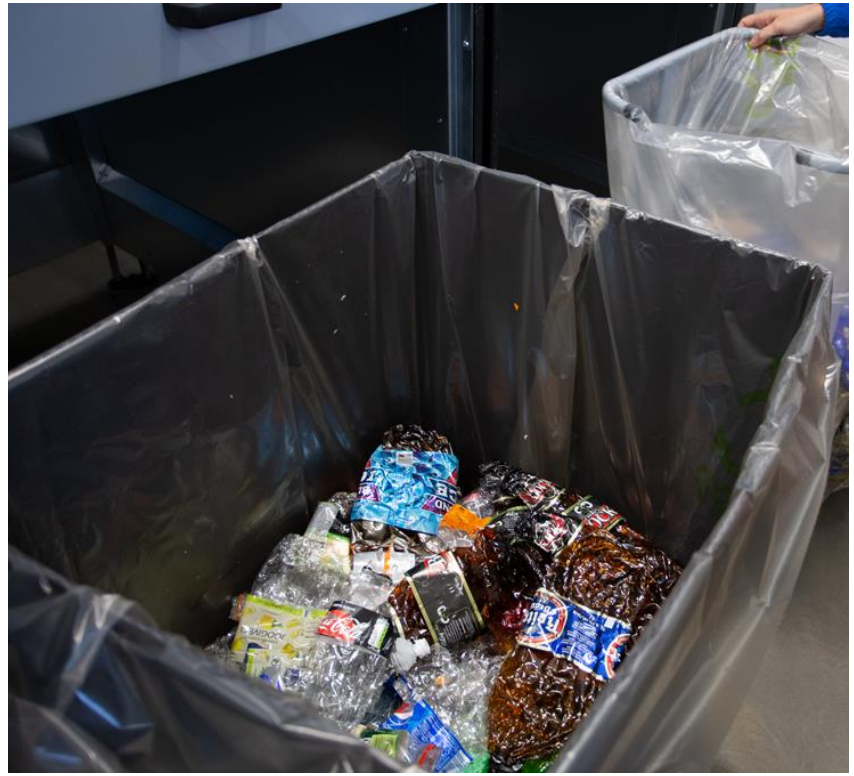
DRS = 30% lower carbon footprint



Cost efficiency

EPR costs

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

Country	PRO	NOK/kg	Collection rate 2019
Norway - **DRS**	INFINITUM	**2,8**	**89.4%**
Austria – non DRS	Ara	**6,95**	Plastic 33.6%/ PET70%
Belgium – non DRS	Fost Plus	**2,46** PET **3,58** HDPE **7,11** Other plastic	**46%**
Sweden (plastic packaging outside DRS)	FTI	**3,26-4,91**	**40%**
Netherlands – non DRS	Avfalfonds Verpakkingen	**3,60-6,00**	
Spain – non DRS	EcoEmbes	**4,33** PET **3,77** HDPE **7,39** other	
Italy – non DRS	Conai	**2,08-3,69**	Plastic **45.5%**/PET**55%** (2018)

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

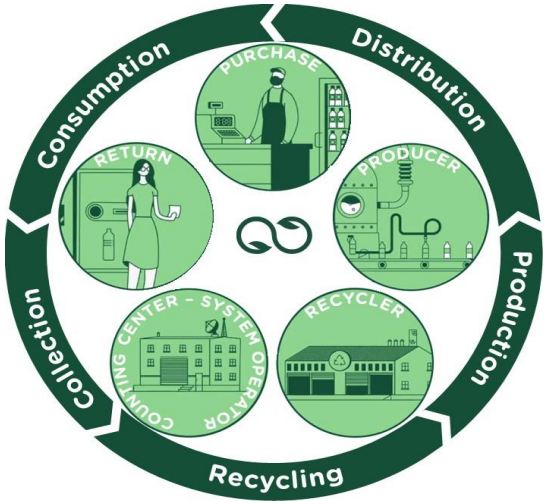
OPEX

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:

https://www.reloopplatform.org/wp-content/uploads/2020/04/Fact-Sheet-Handling-Fees-6April2020.pdf



DRS operator's incomes include:

- Sales of recyclables (recyclables are the ownership of the system operator)
- Unredeemed deposit
- Put to market fees

Net costs' principle – Art 8a Framework directive

- ***Art 8a(4)***
- **EPR must fund:**
- *Separate collection of waste*
- *Subsequent transport and treatment*
- *Information*
- *Data gathering*

- **From the EPR costs the following should be deducted:**
- *Incomes from sales for re-use purposes*
- *Incomes from sales of secondary material*
- *Unclaimed deposit fees*

Operational costs:

- *Direct vehicle, staff, container costs*
- *Door-to-door or bring*
- *Civic ammenity sites*
- *Maintaining capital items*
- *Sorting or processing waste*
- *Waste transportation*
- *Corporate overheads*
- *Marketing*
- *Counting centres (deposit schemes)*

Supporting services:

- *Communications (prevention, reduction, sorting info, litter prevention)*
- *Enforcement costs*
- *Efficiency reviews*
- *Data gathering*
- *Performance incentives*

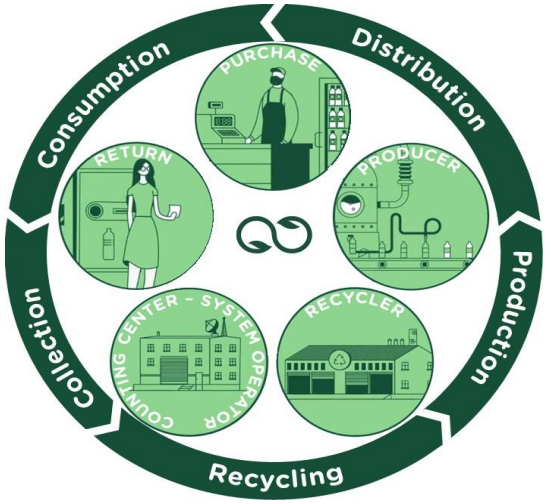
PRO costs:

- *Reasonable and proportionate admin costs*

DRS – closing the loop

Closing the loop on the local market

- Sweden found the practical (”*door-to-door” recycling*) and legal (*right of first refusal*) solution to **close the loop for PET bottles** on the local Swedish market
- Returpack invested in the production hall. The facility was up for a tender (*Build & operate*)
- Recycler purchased the technology line, received guarantee for the input material and has been offering local producers right of first refusal
- 80% rPET is guaranteed
- This model is now being implemented in Norway (picture)



https://www.reloopplatform.org/reloop-hosts-webinar-on-best-practices-for-national-circular-economy/

”Return me to the DRS collection point. I am made out of 100% recycled plastic. Produced in Sweden.”

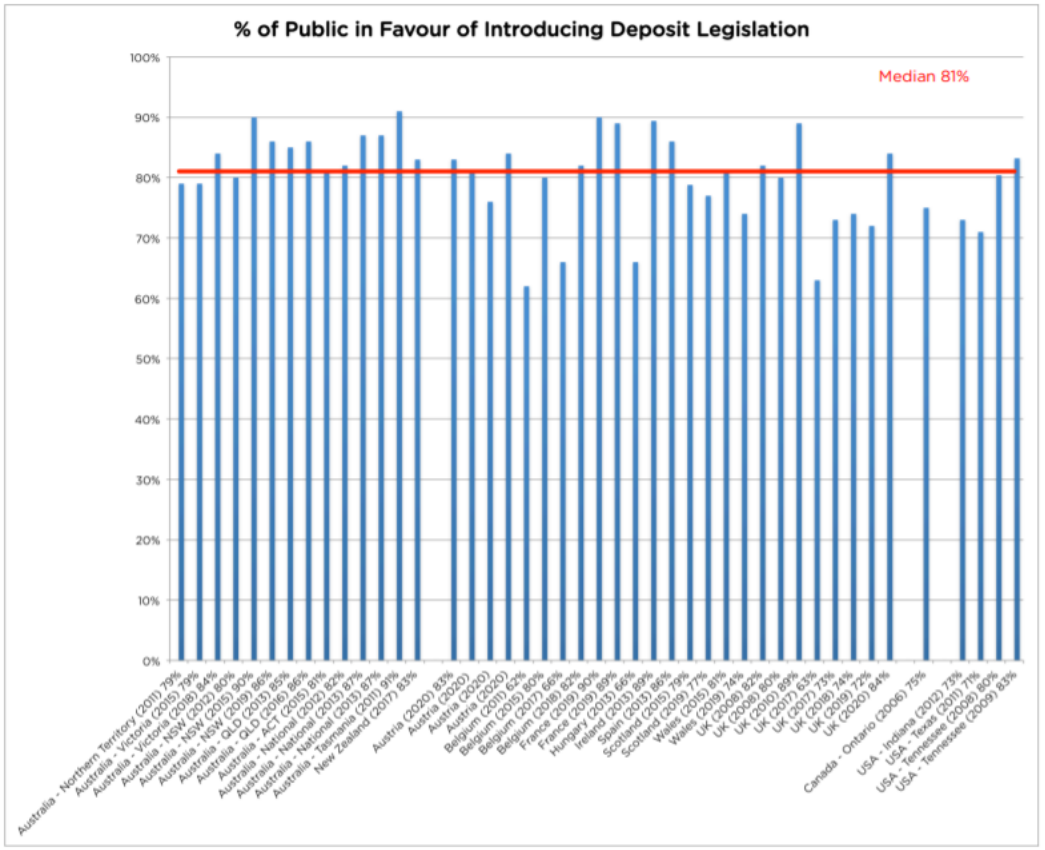
Coca-Cola EUROPEAN PARTNERS

Coca-Cola in Western Europe transitions to 100% recycled plastic (rPET) bottles in two more markets

Thanks to the closed loop recycling model implemented by the Swedish system operator, 3 biggest producers have secured min 50% recycle content in the past decade.
80% of the recycle content is possible in Sweden today based on high-quality material from bevcons introduced to the local market.
Coca Cola Sweden offers their products in 100% recycled bottles.

Consumers' perception

Deposit systems are considered as reliable method for high quality recycling



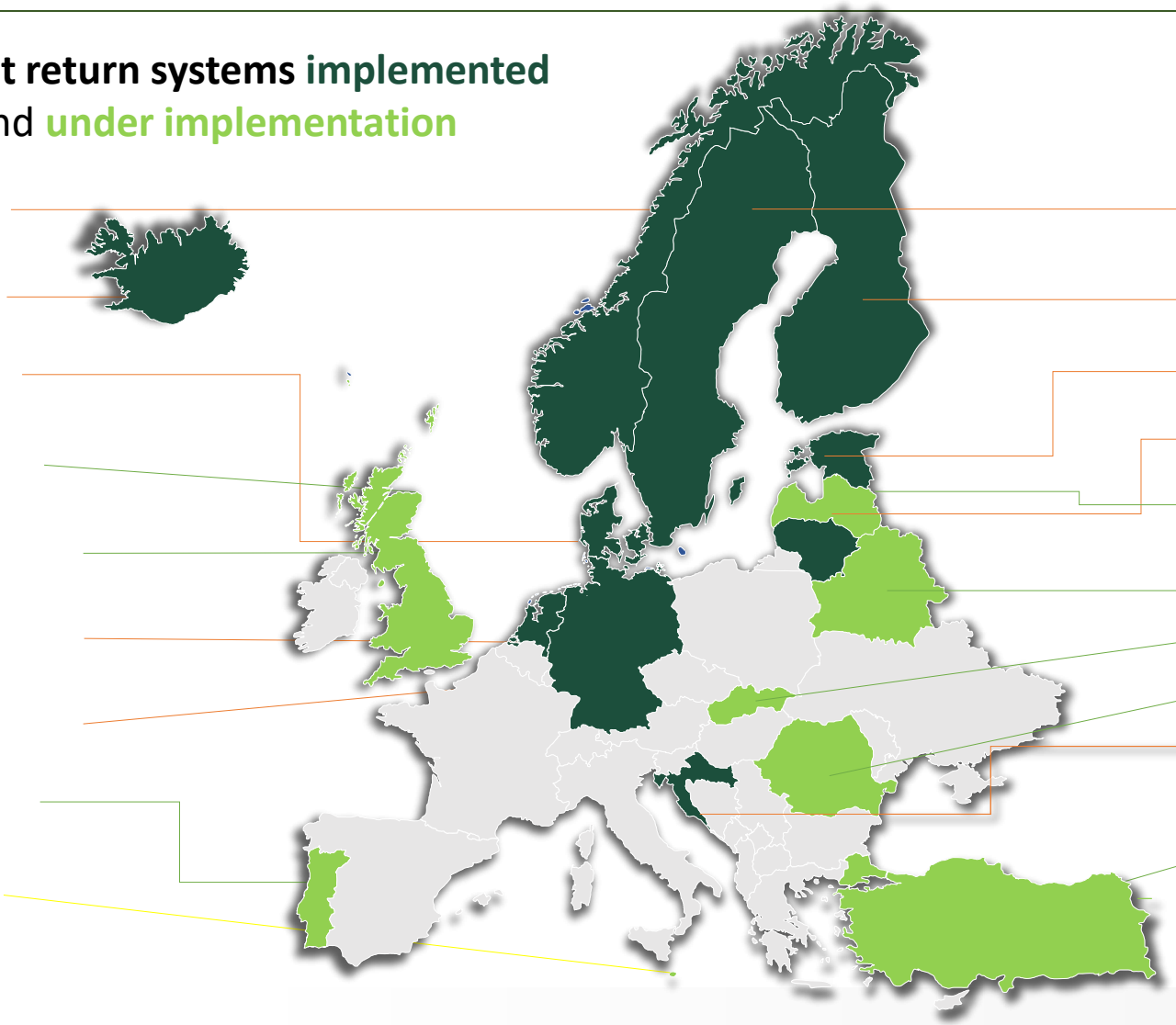
In Sweden, juices are not subject of deposit system. Interestingly, producers are now switching from tetra pack to PLASTIC packaging on voluntary basis. This is because a plastic bottle linked to the DRS has better perception than a multi material packaging type with questionable recycling degree.

DRS and Circular Economy

- Maximized collection
- Good quality material
- Recycled content
- Low carbon foot print
- Local implementation
- Cost efficiency

Deposit systems in Europe

Deposit return systems implemented
and **under implementation**



- Norway (1999)
- Iceland (1989)
- Denmark (2002)
- Scotland (2021)
- 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)

Thank you!
Anna Larsson

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resources remain resources