

Experience with the introduction of a mandatory deposit system in Germany

Packaging Waste Workshop
Ministry of Environment and Water
ÖKO-Pannon

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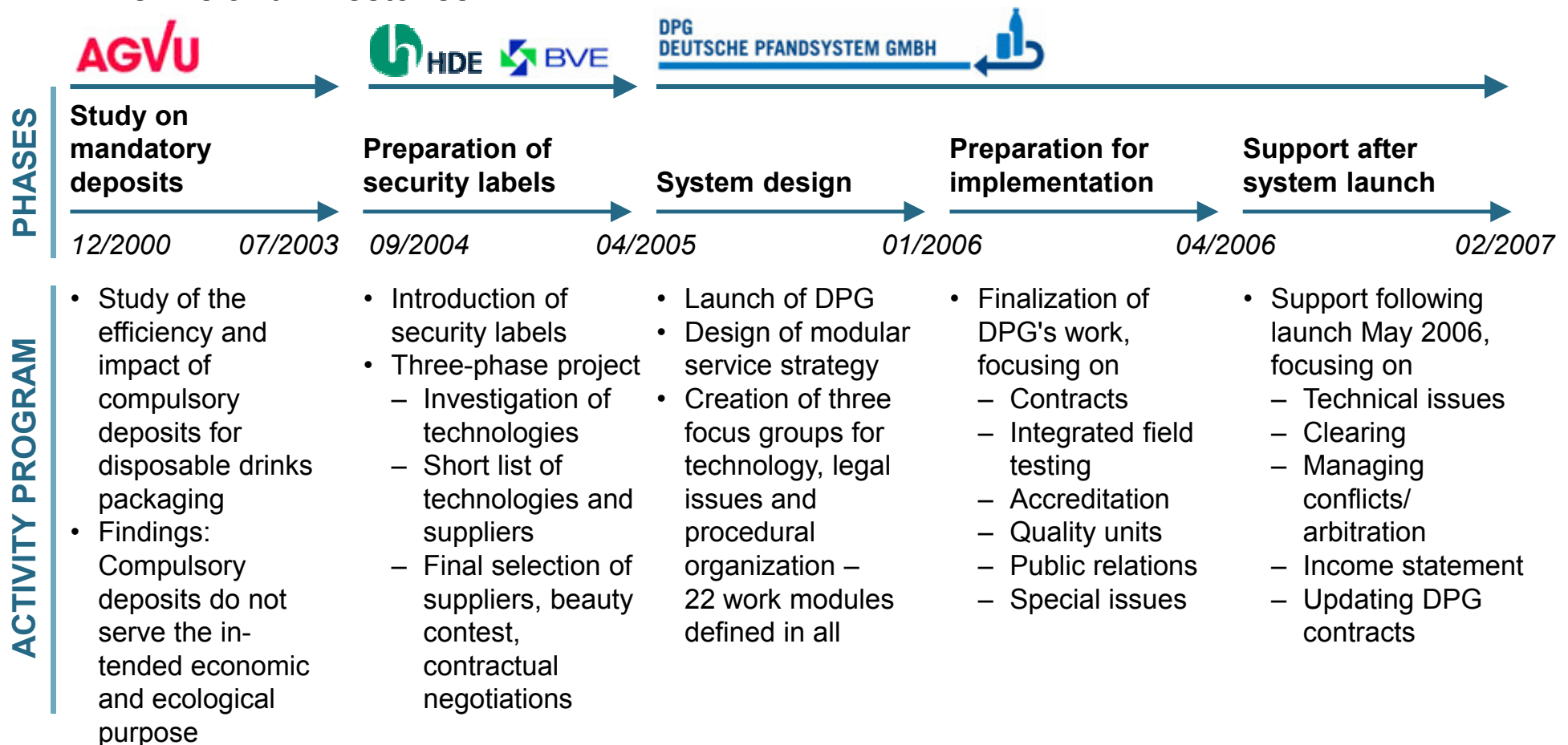
Budapest, February 24, 2009

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Roland Berger has been involved in the discussion around a mandatory deposit system in Germany since the very first beginning

Time line and milestones



A. Political goals of the mandatory deposit system in Germany

The major political goal of the German Packaging Ordinance is to stabilize and increase the share of refillable packaging

Political goals of the German Packaging Ordinance in respect of drinks

Goal	Intended impact	Description
Refillable packaging quota		To stabilize and increase the refillable packaging quota
Littering		To reduce litter from disposable drinks packaging thrown away in public spaces
Recovery/ recycling		To increase recycling of materials from which disposable drinks packaging are made of

Since May 2005, a uniform deposit of 25ct has been compulsory, e.g. for beer, water and soft drinks sold in disposable packaging

Compulsory deposit regulation in Germany

A compulsory deposit ...

Compulsory deposits

- Deposit is levied initially by the bottler and then passed down through every link in the retail chain
- Consumers pay the deposit when they buy

Obligation to accept returns

- Retailers must take back empty packaging ...
 - ... in return for the deposit
 - ... free of charge
 - ... in the vicinity of the place of sale

... of 25 cents ...



- **Uniform compulsory deposit of 25 cents** regardless of the type of drink and size of the container

... applies only to certain types of drinks ...

- **Beer**, mixed drinks containing beer and non-alcoholic beer
- **Water**
 - Carbonated or not
 - Flavored or not
- **Soft drinks**
 - Carbonated or not
- **Energy drinks**
- **Fruit juice drinks**
- **Mixed alcohol drinks**
- Exception: Diet & sugar free drinks

... sold in certain types of packaging (type and size)

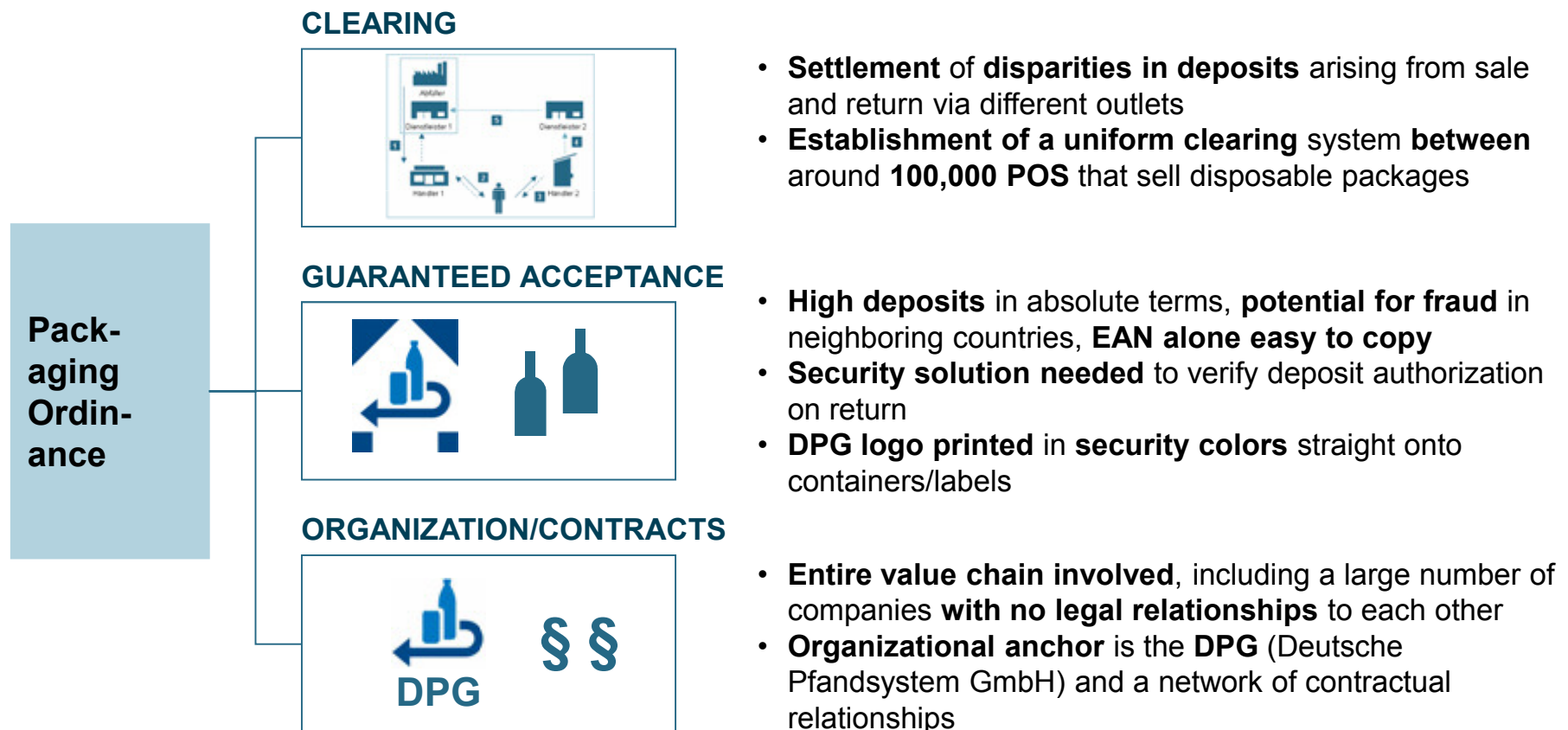


- Ruling applies to **volumes from 0.1 liter through 3 liters**
- **Materials covered:**
 - Metal
 - Glass
 - Plastics

B. Set up of the system and organizational implications for stakeholders

Clearing, guaranteed acceptance and organizational set up were the main requirements arising from the Packaging Ordinance

Requirements arising from the Packaging Ordinance for a deposit system



All involved stakeholders are facing major changes – adaptation of production, warehouse and logistics processes necessary

Implications for stakeholders

Packaging industry



- **Certification** needed for production plants
 - **Initial** certification
 - **Annual** re-certification
- **Alignment of production processes** according to certification guidelines
- Set up **quality control** system for DPG-symbol
- **Investment** for in-line or off-line **inspection systems**

Bottlers



- **Redesign of labels / decors** on cans in order to show DPG-symbol
- Use of **new** and separate **EAN** for products under mandatory deposit
- Identify **certified label printer / can manufacturer** for production of packaging
- Build **secure warehouse** for storage of empty cans / labels (danger of theft)

Retailers



- Extensive **investments in reverse vending machines**
 - Acquisition of new machines
 - Adaptation of existing machines
- **Use of shop space** for reverse vending machines and storage for returned containers
- Set up of **separate logistics** for returned containers

C. Technical details of security system

High deposits and considerable potential for fraud necessitate the use of security technologies – EANs alone insufficient

Details of the need for security technology

Deposit amount and manufacturing costs

- At 25 cents, deposit is high in absolute terms
- It is also very high relative to the price of the drink and the container



- EAN code is easy to copy if it is the only security feature
- Weight and form recognition systems for disposable packaging are unsuitable



Existing recognition methods unsuitable

Numerous neighboring countries

- Neighboring countries
 - Sell drinks without levying deposits
 - Have varying income levels



**Need for
secure technology**




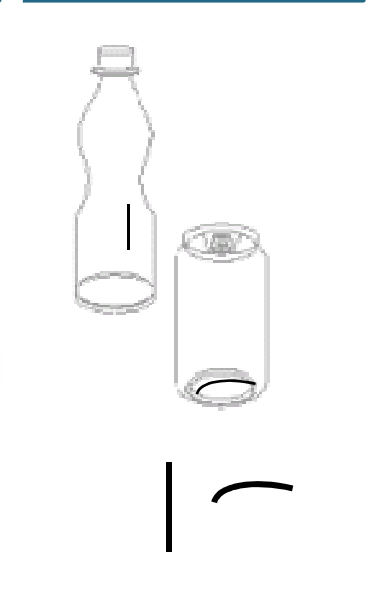
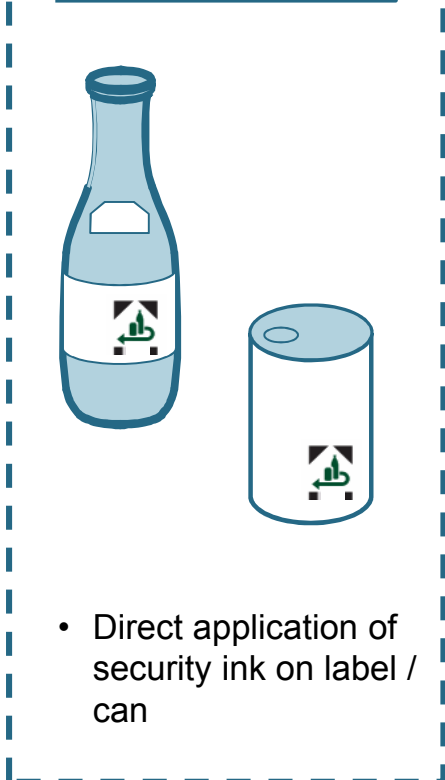
- Use of reverse vending machines creates an anonymous environment, which significantly lowers the threshold for fraud relative to manual, face-to-face returns



Containers returned anonymously at machines

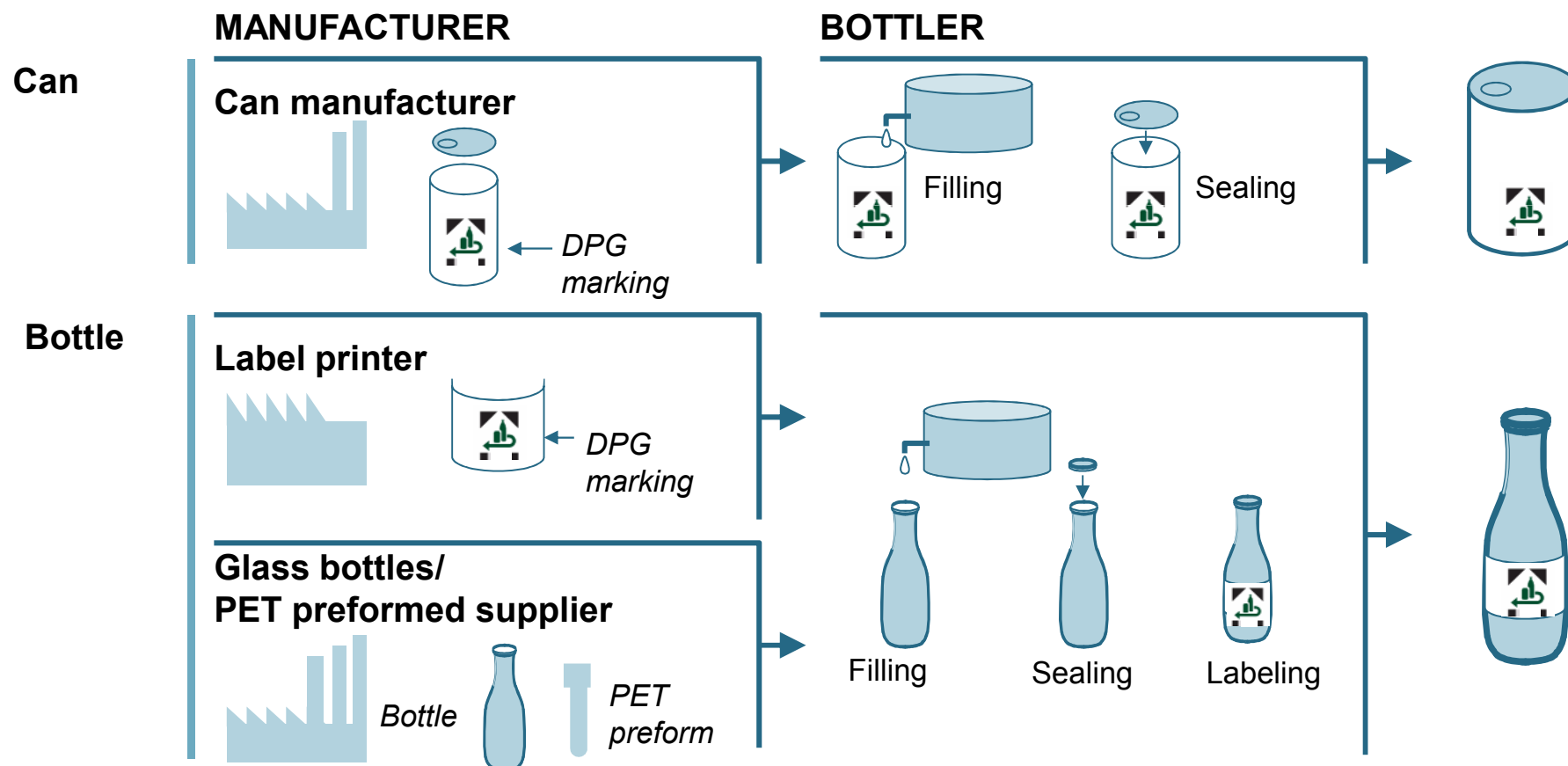
From five fundamentally different security solutions the direct marking for labels and cans was chosen

Technology security solutions

Existing markings	Value label	Code-Label	Transponder	Direct marking
				
<ul style="list-style-type: none"> • Additional markings <ul style="list-style-type: none"> – Top engraving – UV-strip 	<ul style="list-style-type: none"> • Visible and invisible security markings 	<ul style="list-style-type: none"> • Unique code for each container 	<ul style="list-style-type: none"> • Micro wire produced from a special material composition 	<ul style="list-style-type: none"> • Direct application of security ink on label / can

Production of packaging is heavily affected by introduction of DPG marking with special DPG-Ink – bottling process remains the same

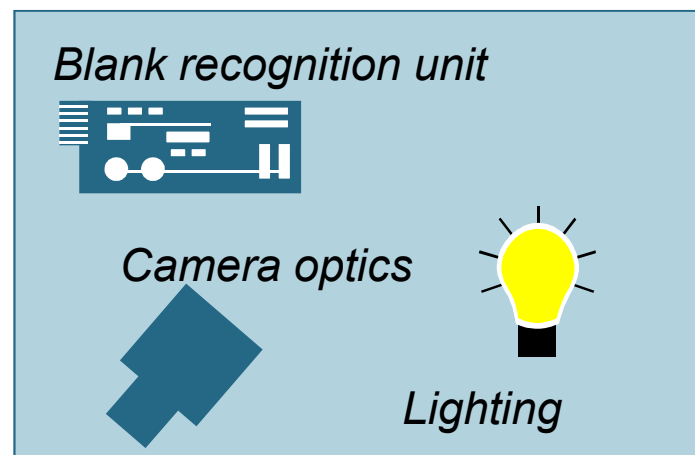
Production process



Reading units had to be integrated into RVMs for recognition of DPG-marking – retrofitting RVMs possible – high investment for retailers

Retrofitting reading technology

Reading unit



- Production of reading units is possible by use of operating descriptions distributed by the DPG with the use of available standard components

Reverse vending machine

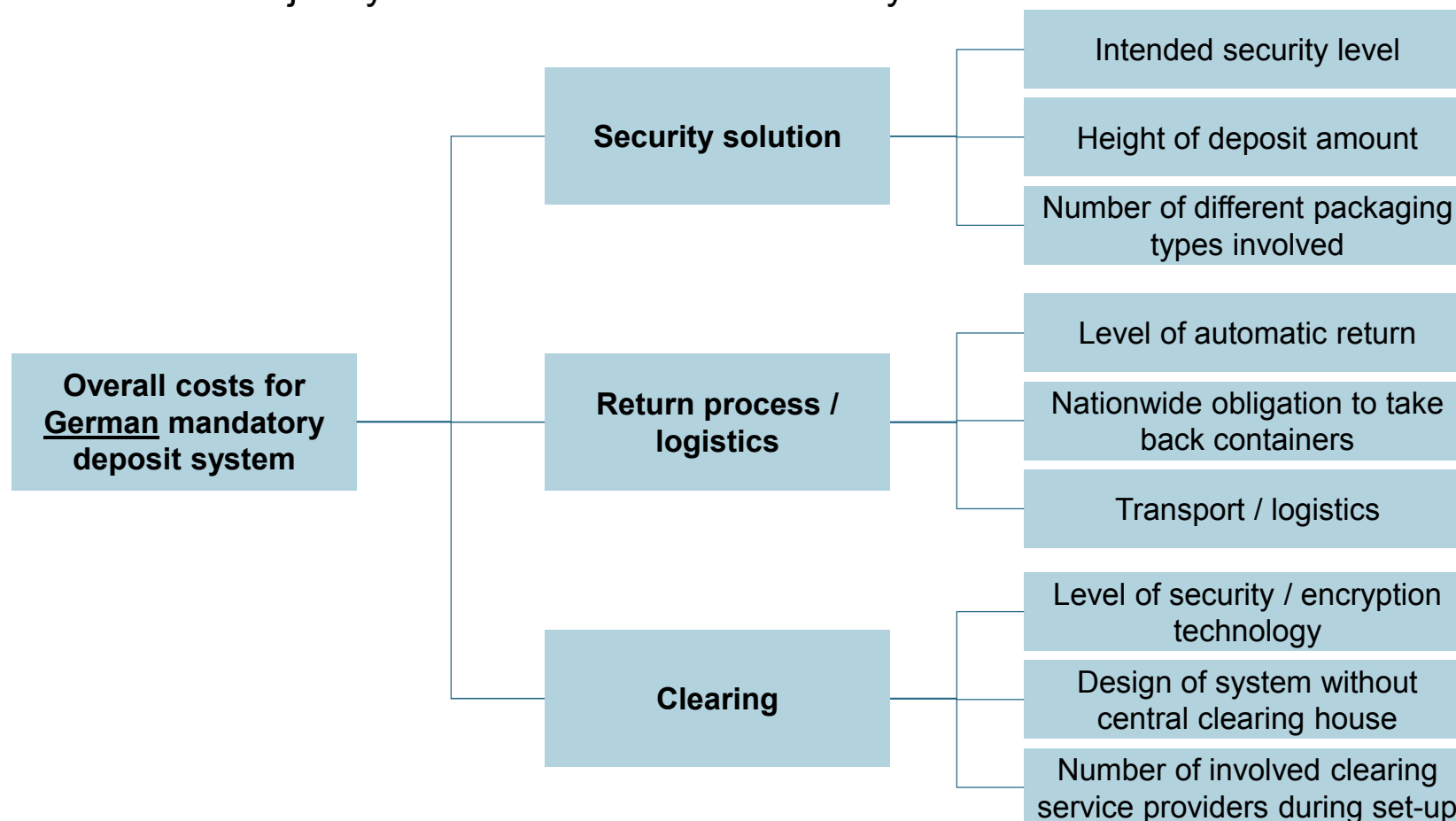


RVM – Reverse Vending Machine

D. Financial implications for stakeholders

The overall costs for the deposit system depend on numerous system specific variables

Selection of major system cost variables Germany



The various stakeholders involved in the system in Germany have to shoulder high investments and significant ongoing annual costs

Overview system costs

Stakeholders

- **Retail**

1

- **Industry**

2

- Bottlers
- Packaging manufacturers
- Label printers
- Can manufacturers

Parameters analyzed

Investment to develop the deposit system

- Assumption: **Replacement investment** is effected in each period
- **Depreciation** is based on useful life and is **factored into the annual cost**

Annual cost to operate and maintain the deposit system

- Assumption: Market volume of **14 billion disposable containers** p.a.

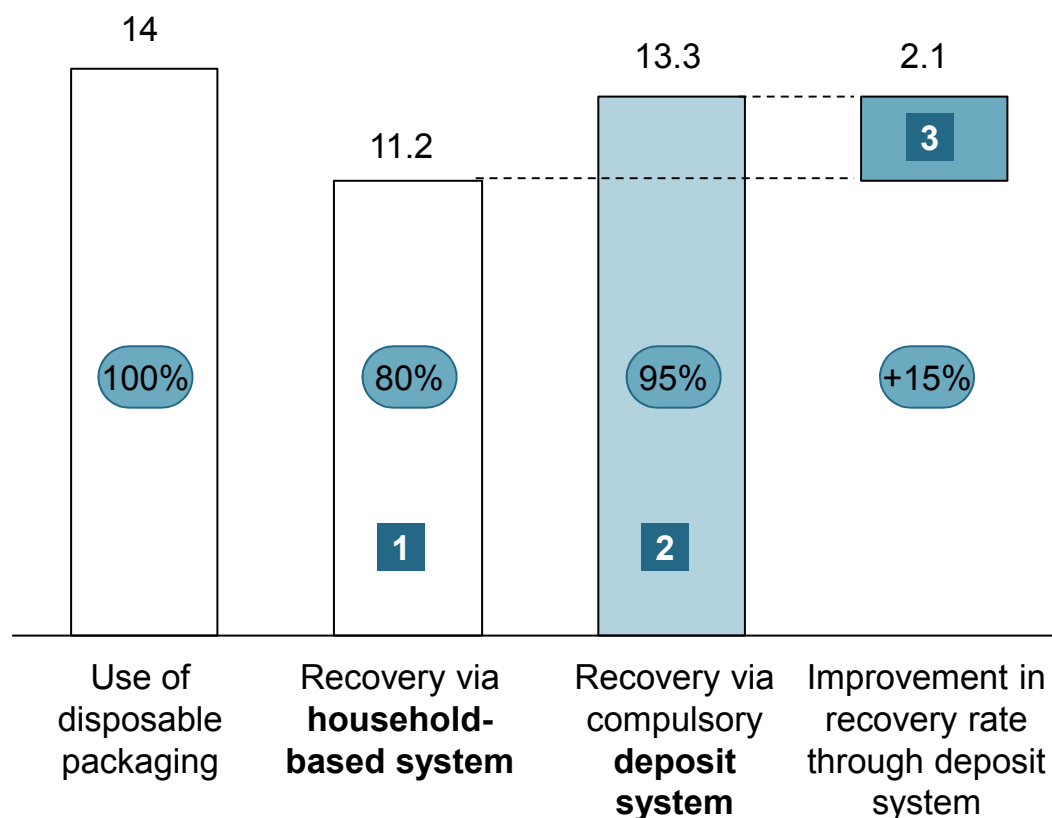
Costs

Initial investment:
EUR 726 m
Retail 702 m
Industry 24 m

Annual cost:
EUR 793 m
Retail 699 m
Industry 94 m

In comparison to the existing household-based collecting system the deposit system can only slightly increase the recycling rate

Recovery volumes by collection system [billion units]



Comments

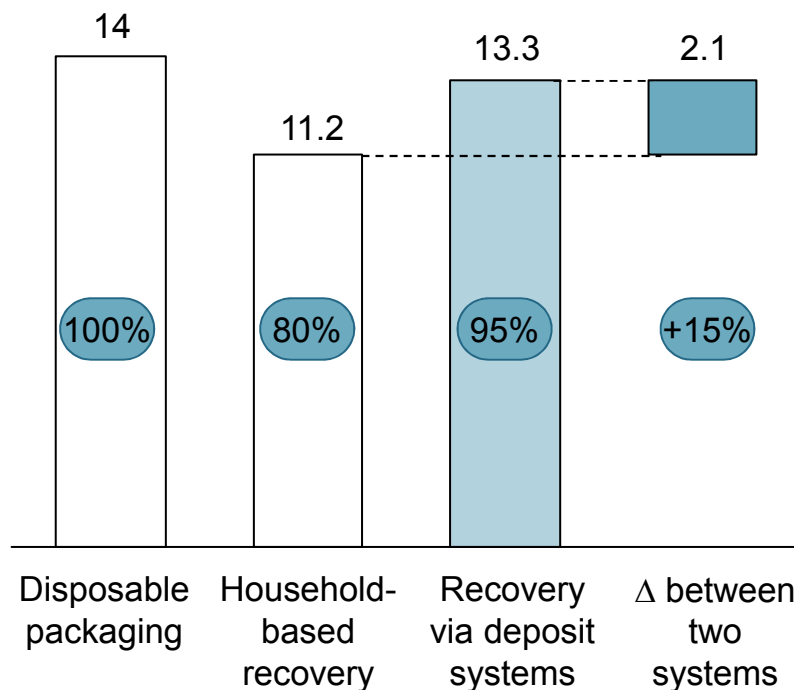
- 1 Recovering disposable containers via **household-based systems** leads to a **recycling rate of ca. 80%**

DSD's container recovery rate stood at **around 80%** before compulsory deposit was introduced
- 2 **Compulsory deposit systems** can achieve **around 95%**
- 3 Increase of 15% is realized **thanks to superior return levels**
 - **Deposit** creates **incentive** to return containers
 - Containers that consumers throw away are mainly **returned via other collectors**

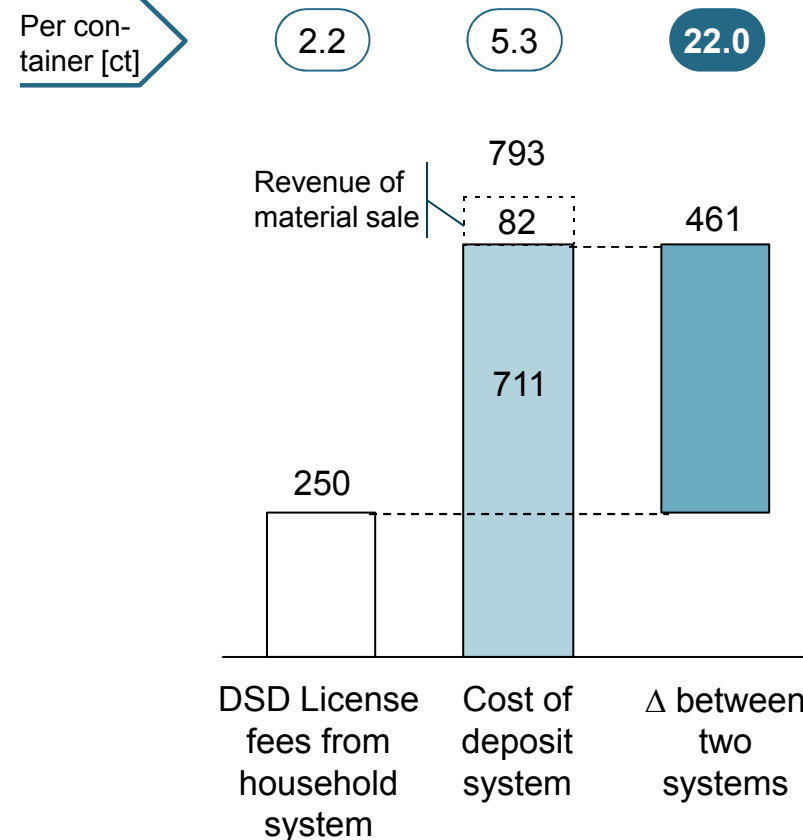
For this slight increase in recycling rate a second complex and costly system had to be organized – marginal cost of 22ct for each container

Marginal cost analysis: household-based recovery versus compulsory deposit

Volume [billion units]



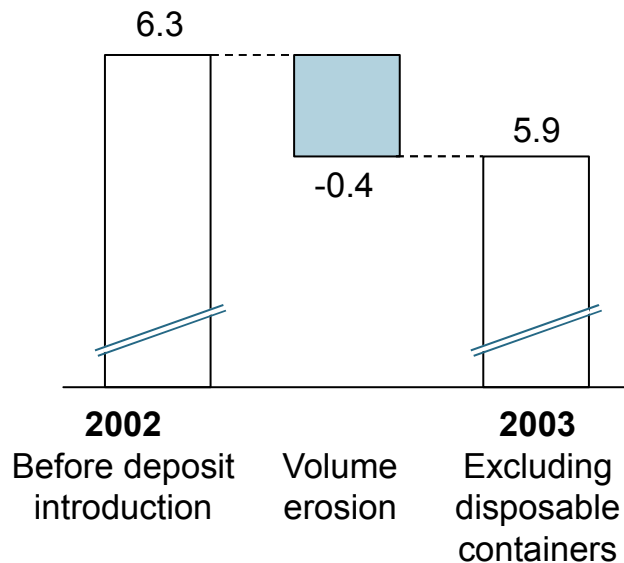
Annual cost [EUR m]



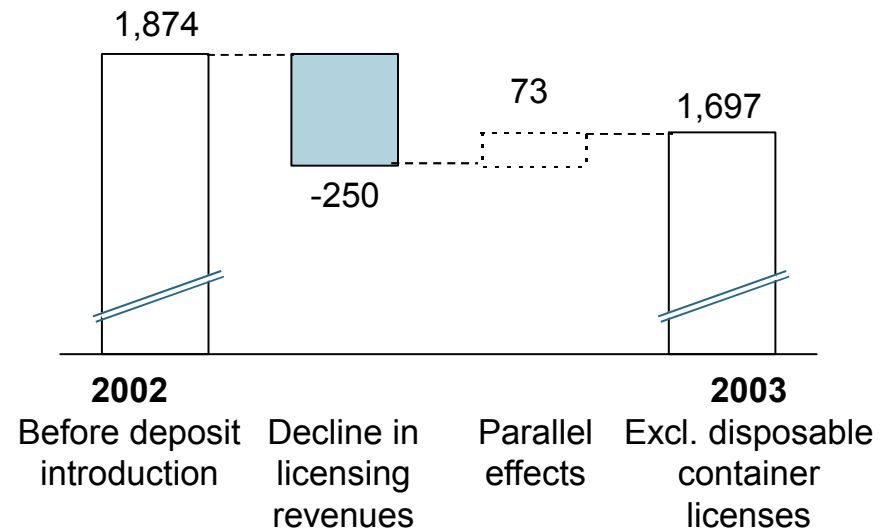
Compulsory deposits have deprived DSD of 400,000 t of recyclable materials – Licensing revenues thus down by EUR 250 million p.a.

Household-based collection, 2002-2003

Collected volume [million t]



Sales [EUR m]

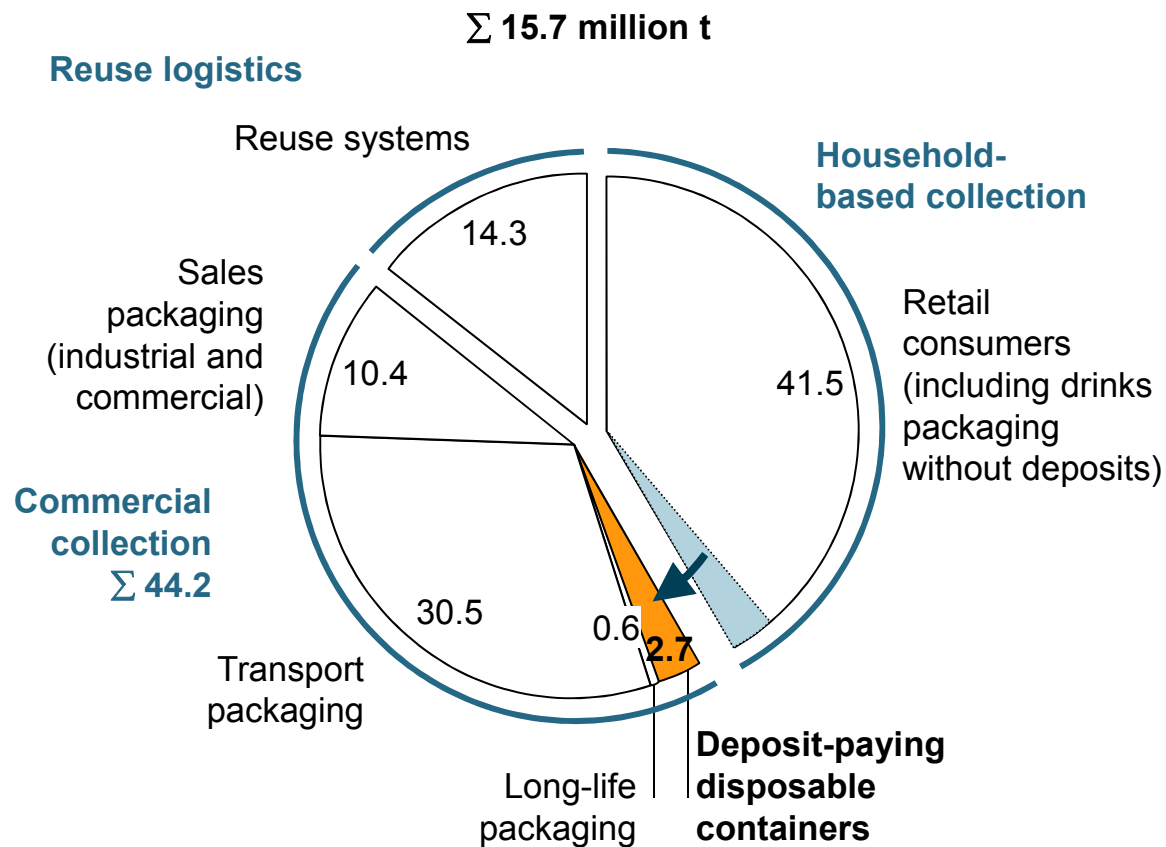


- Since **compulsory deposits** were introduced in 2003, disposable containers were no longer collected via household-based systems
- Dual systems are thus losing around **400.000 t** of good recyclable material per year

- **DSD sales** hit **EUR 1.9 bn p.a.** before deposits
- Since deposits were introduced, **licensing revenues** have **declined** by around **EUR 250 million p.a.**
- Positive business development has provided little **compensation**

Disposable drinks packaging account for only a small fraction of the total packaging waste volume – 2.7% in 2005

Packaging consumption by form of collection in 2005 [%]



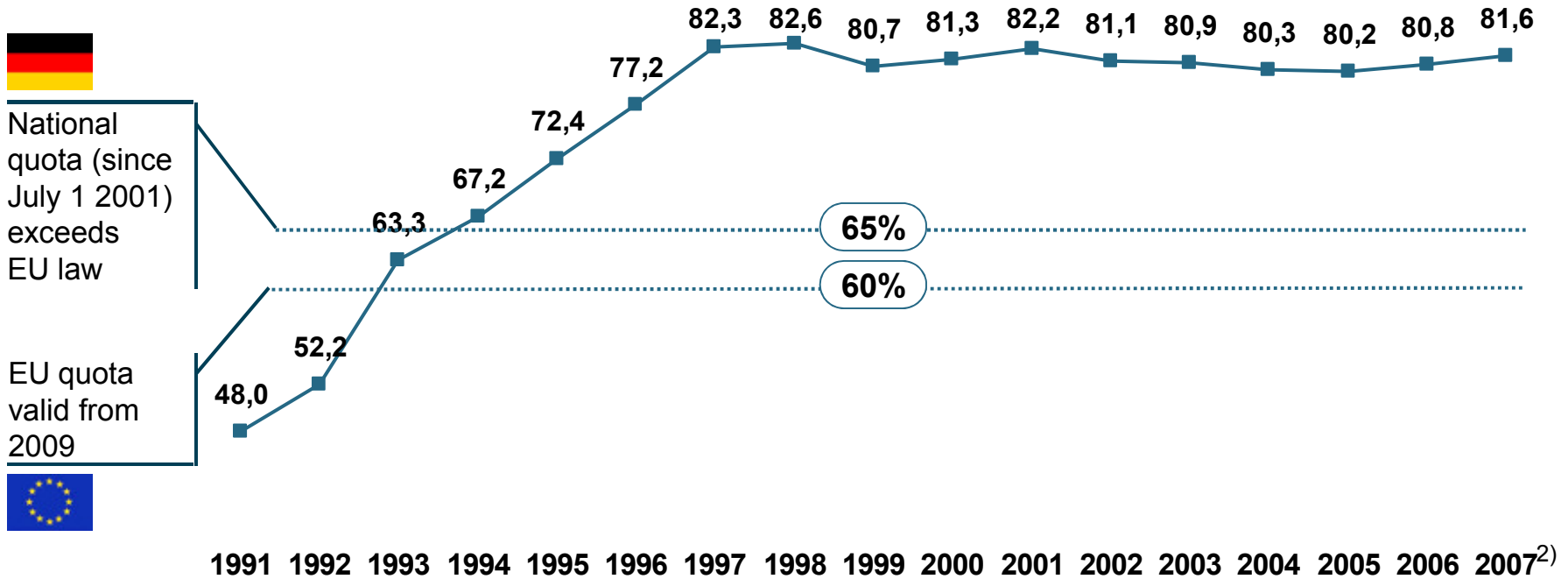
Notes

- The market defined by the Packaging Ordinance consists of three parts:
 - Household-based collection
 - Commercial collection
 - Reuse logistics
- Introduction of compulsory deposits took disposable drinks packaging out of the household-based collection segment and fed it into a separate collection system

Germany already meets the minimum national recycling quota (Packaging Ordinance) and the EU standards valid as of 2009

Recycling quotas for selected materials¹⁾ in Germany, 1991-2007 [%]

Minimum recycling quota



1) Glass, tinfoil, aluminum, plastics, paper and liquid packaging board account for around 82% of total packaging consumption

2) Preliminary

E. Market development since introduction of the system

Mandatory deposit has not reached its goal of stabilizing share of refillable packaging – inefficiencies due to parallel collection systems

Overview market impacts of deposit system

1

Impact on retail and industry

- **Refillable packaging quota not stabilized**
- **Drivers for disposable drink packaging remain intact**
- **Investments necessary in systems to accept returned packaging and in a clearing system**

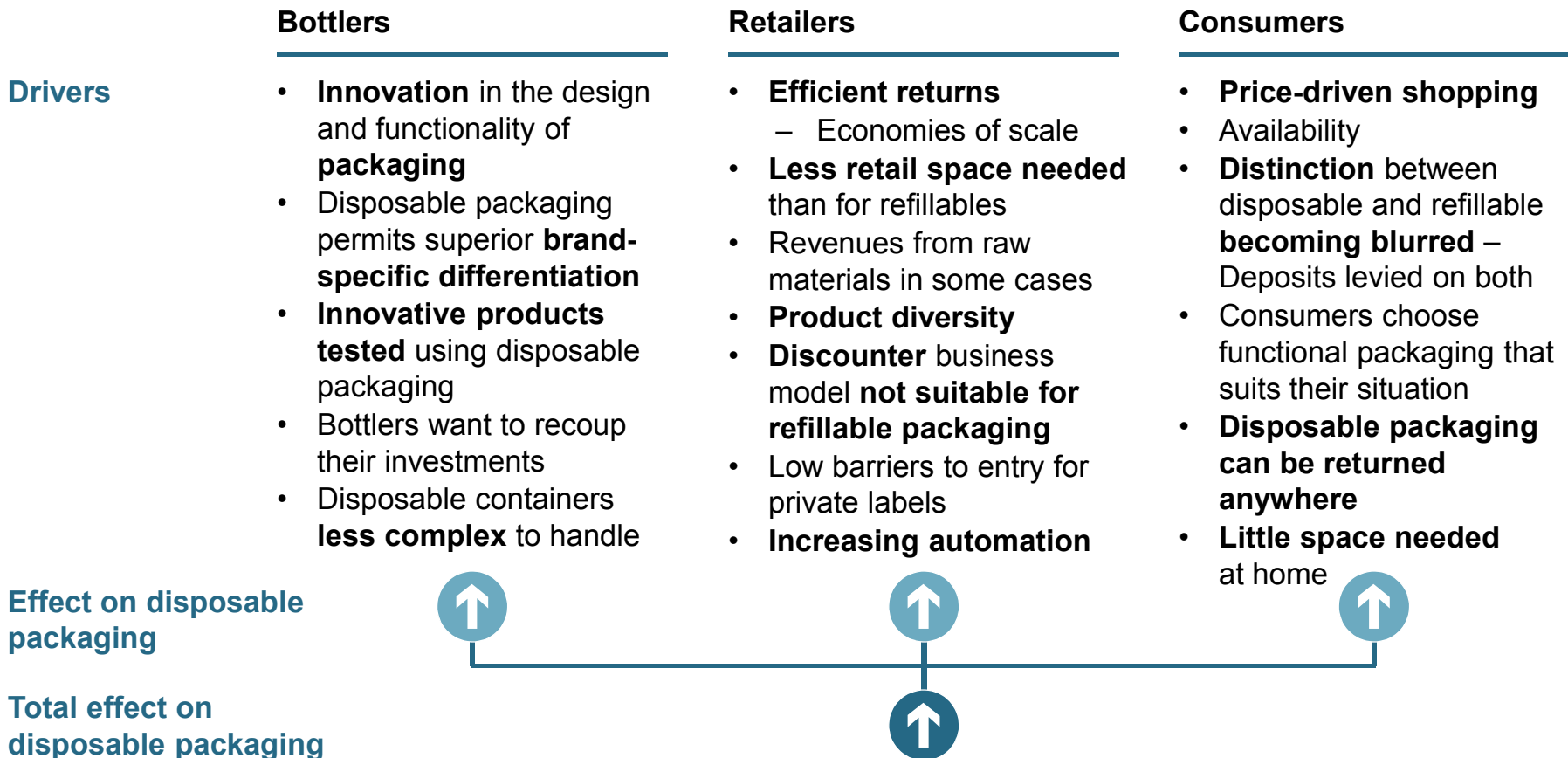
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Impact on the recycling market

- **Dual systems**, which work efficiently, have been **deprived of a large share of the packaging volume**
- **Efficiency** of dual systems has been **eroded** – Remaining licensees **may face price increases**
- A **separate collection system** for disposable drinks packaging had to be **set up and operated at considerable expense**

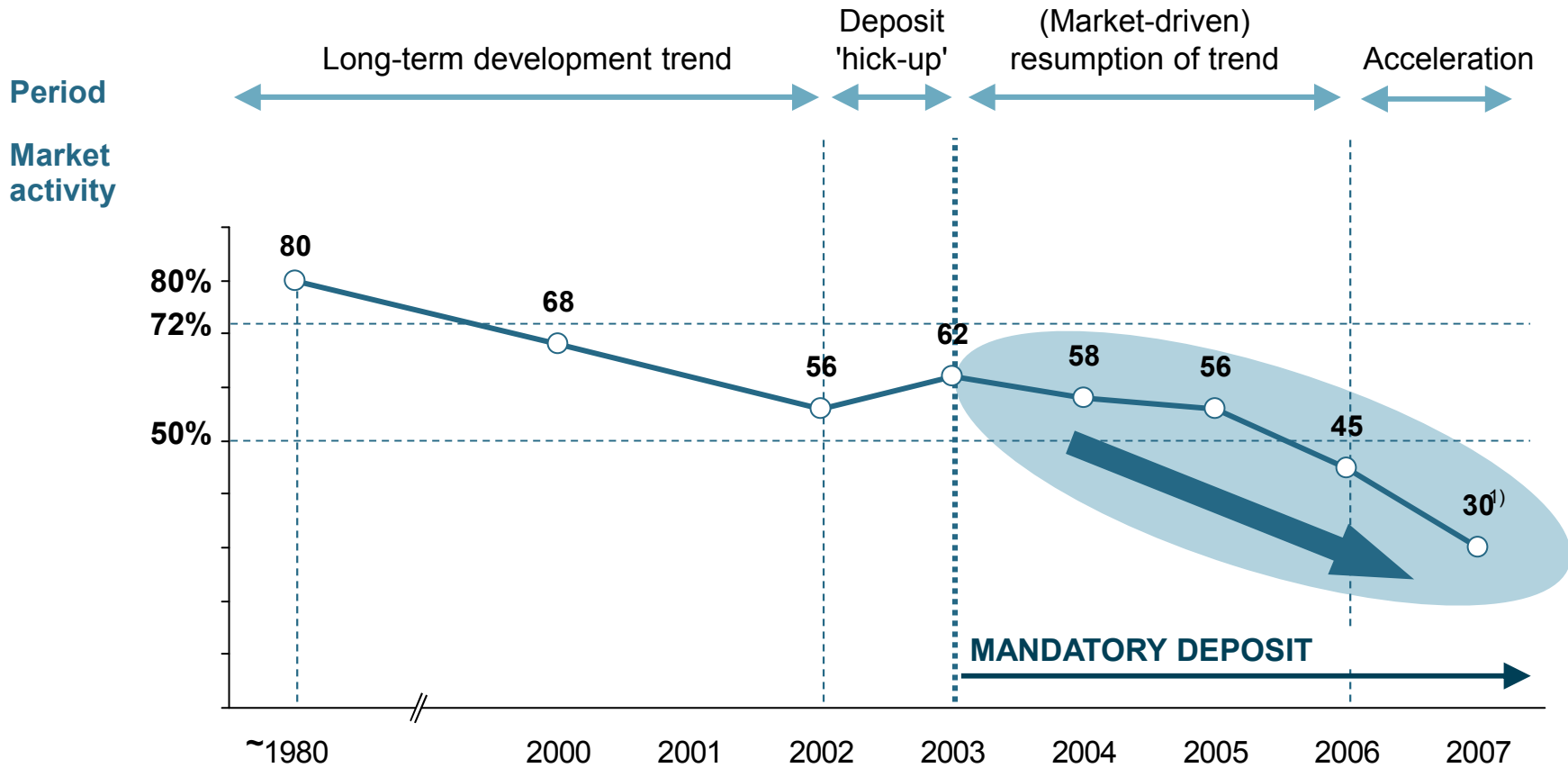
Despite the introduction of the mandatory deposit system, the drivers for disposable drinks packaging remain intact

Drivers for disposable drinks packaging



As drivers for one-way packaging are intact the share of refillable packaging keeps on declining

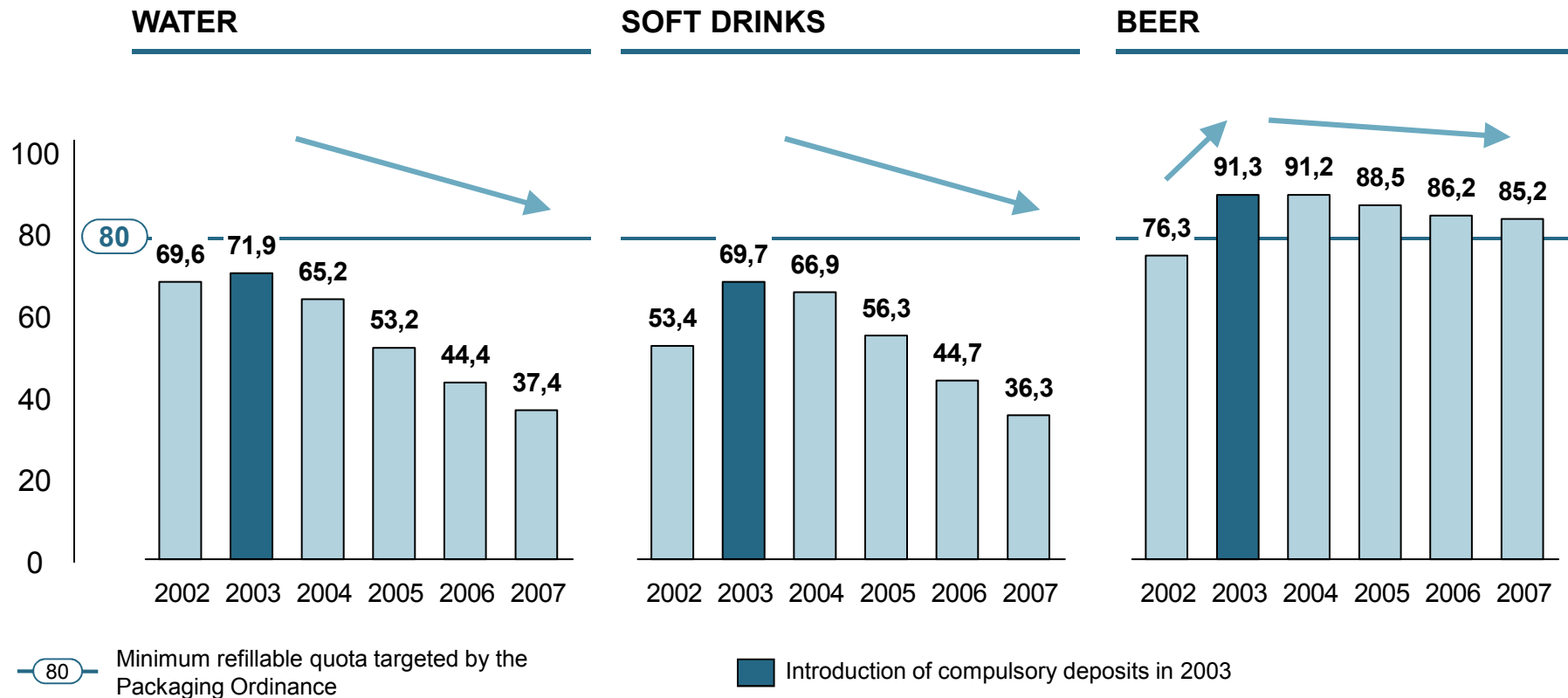
Trend in the proportion of refillable packaging in Germany, 1980-2007 [%]



1) Soft drinks only

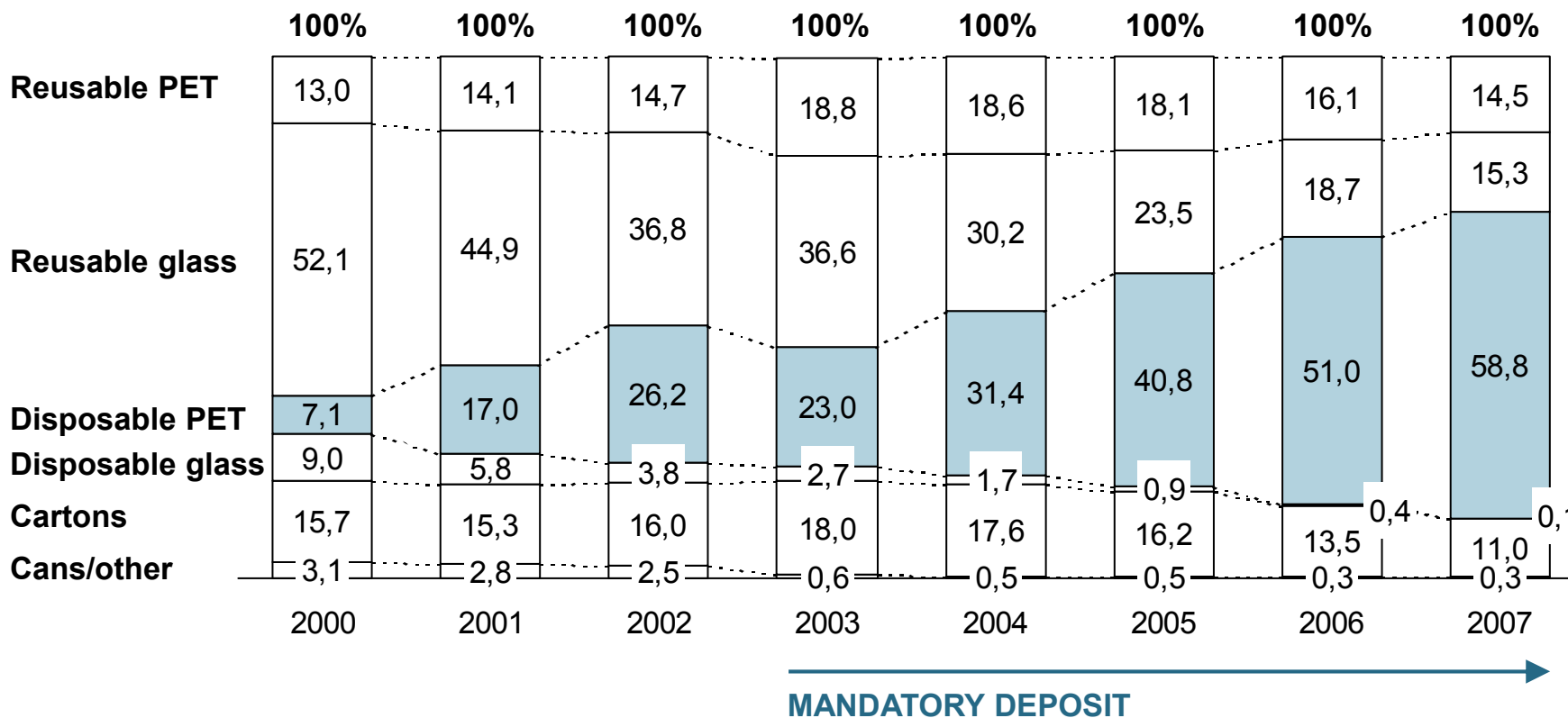
Brief improvement in share of refillable packaging only directly after introduction of deposit in 2003 – since then decline in all categories

Trend in share of refillable drinks packaging



Growth in disposable PET bottles for non-alcoholic drinks halted briefly after deposit introduction – and has since more than doubled

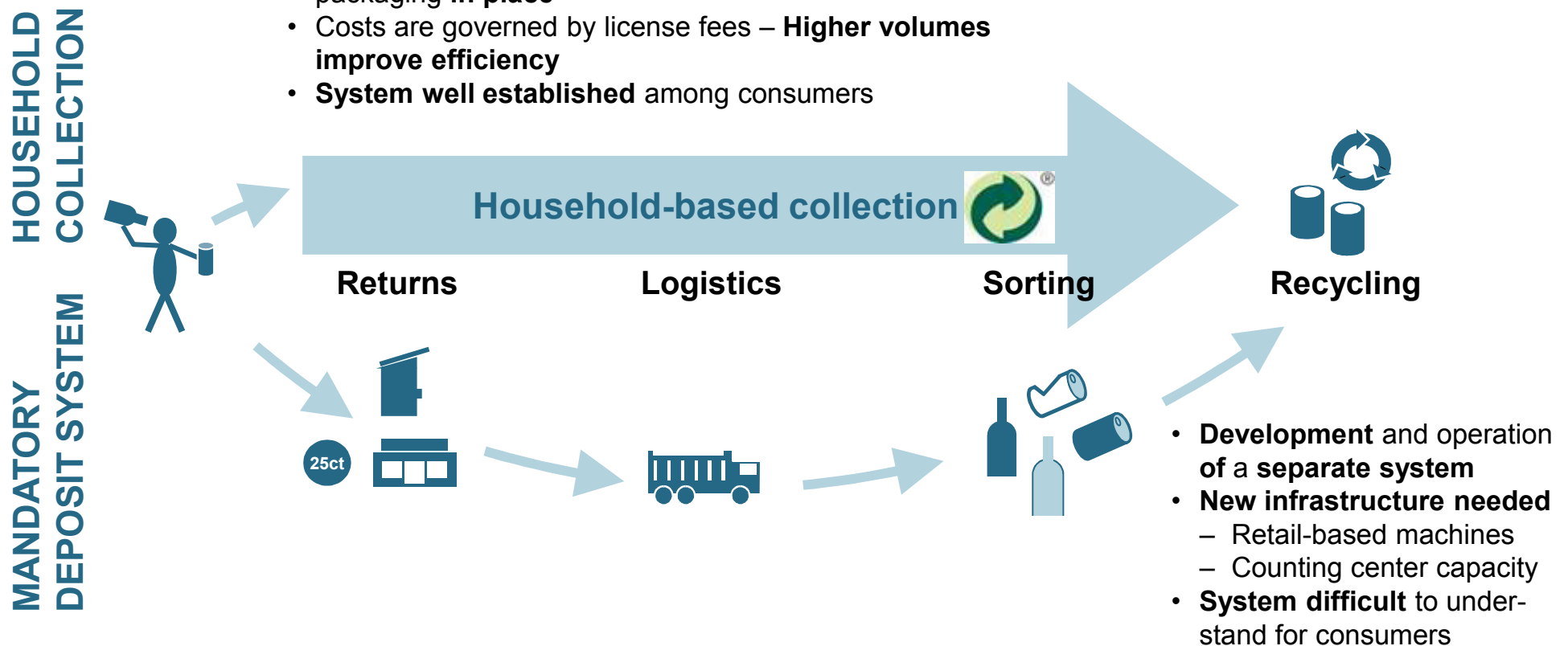
Packaging structure for non-alcoholic drinks [%]



Operating a compulsory deposit system in parallel erodes efficiency of household-based collection – existing infrastructure is not used

Collection systems

- **Complete infrastructure** to collect, sort and recycle packaging **in place**
- Costs are governed by license fees – **Higher volumes improve efficiency**
- **System well established** among consumers



F. Concluding remarks

The mandatory deposit in Germany has failed to meet the goals that were intended from the Packaging Ordinance

Intended impact

Environmental policy goals for compulsory deposits

MORE REFILLABLE PACKAGING



LESS LITTERING



MORE RECYCLING



Actual impact

- Destabilization of the refillable packaging system
- Refillable quota is falling consistently



- Drinks packaging account for only 6% of littering, so hardly any material impact
- The majority of litter in the form of non-packaging materials – film/foil, cigarettes, paper etc. – remains unaffected



- Drinks packaging account for only 2.7% of packaging consumption, so no material impact
- Recycling rates already high – mainly thanks to dual systems



A clear definition of goals wanted from the deposit system should be prepared prior to a detailed introduction planning

Concluding remarks

When discussing the introduction of a deposit system the following questions should be answered first

What are the **major goals** and **motivations** for setting up a deposit system? What should be **achieved**?

Are all involved parties **aware of** the **complexity** and the **costs** for the design / set up of the system?

Are there **alternatives** for achieving the same goals and achievements in a less complex way?

Always keep an eye on the overall goal in order to prevent suboptimal solutions

G. Contacts

Please contact us with any questions or issues you would like to raise. Thank you!

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