EUROPEAN PACKAGING POLICY

The consequences of a deposit system for disposable packaging based on the German example

AGVU

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Using Germany as an example, this study aims to illustrate the impact of introducing deposits on disposable packaging

Goals of the study

- To outline the development and goals of the German Packaging Ordinance as basic conditions for the setting up of a deposit system for disposable drinks packaging

- To analyze and reveal the consequences of setting up a deposit system for disposable drinks packaging for the different groups involved with special focus on economic conditions and inefficiencies

- To sum up results in order to help other countries learn lessons from the German example – recommendation for optimized house-hold-based collection as consumer and environmentally friendly system with lower costs than a deposit system

- To gather facts and figures about the consequences of introduction of a deposit system in Germany

Source: Roland Berger
European packaging policy is based on the principle of responsibility for products – Waste avoidance commands top priority

European packaging policy

Goals

Principles


• European packaging policy is based on the principle of responsibility for products and states waste avoidance as its top priority

• Responsibility for products involves:
  – Taking steps to avoid waste and providing for recovery and recycling options as early as the production phase
  – Using recoverable waste and/or secondary raw materials
  – Taking waste back and recycling or disposing of it after it has been used

• In practice, this legislation is enforced by minimum recycling quotas with which member states must comply

Source: EU Packaging Directive, Closed Substance Cycle and Waste Management Act, European Court
The DSD dual system launched in 1990 created an efficient collection system that realized high recycling rates

Household-based collection via Duales System Deutschland (DSD)

**Waste situation**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1991</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>1995</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>2000</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>2005</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

**Description**

- **In the late 1980s/early 1990s**, the focus was on avoiding and reducing waste – Recycling was not yet widespread.
- **1990** – The individual obligation to accept returned packaging anchored in the Packaging Ordinance necessitated a system via which retail and industry could take back packaging materials.
- Recycling rates have risen sharply since the Packaging Ordinance came into force in 1991.
- The volume of waste left over for disposal (incineration/landfills) has fallen steadily.
- DSD collects and handles **62.7 kg** of recyclable materials per German resident – the highest per-capita figure in the world.
- Consumers’ awareness of the value of packaging waste has been transformed.

Source: Roland Berger, GVM, DSD
Germany already meets the minimum national recycling quota (Packaging Ordinance) and the EU standards valid as of 2009

Recycling quotas for selected materials\(^1\) in Germany, 1991-2005 [%]

Minimum recycling quota

<table>
<thead>
<tr>
<th>Year</th>
<th>National quota (since July 1 2001) exceeds EU law</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>48.0</td>
</tr>
<tr>
<td>1992</td>
<td>52.2</td>
</tr>
<tr>
<td>1993</td>
<td>67.2</td>
</tr>
<tr>
<td>1994</td>
<td>63.3</td>
</tr>
<tr>
<td>1995</td>
<td>72.4</td>
</tr>
<tr>
<td>1996</td>
<td>77.2</td>
</tr>
<tr>
<td>1997</td>
<td>82.3</td>
</tr>
<tr>
<td>1998</td>
<td>82.6</td>
</tr>
<tr>
<td>1999</td>
<td>80.7</td>
</tr>
<tr>
<td>2000</td>
<td>81.3</td>
</tr>
<tr>
<td>2001</td>
<td>82.2</td>
</tr>
<tr>
<td>2002</td>
<td>81.1</td>
</tr>
<tr>
<td>2003</td>
<td>80.9</td>
</tr>
<tr>
<td>2004</td>
<td>80.3</td>
</tr>
<tr>
<td>2005</td>
<td>78.8</td>
</tr>
</tbody>
</table>

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

Source: GVM, BMU, EU Packaging Directive, Packaging Ordinance
Disposable drinks packaging accounts 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

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

Compulsory deposits arrangement in Germany

A compulsory deposit ... ... of 25 cents ... ... applies only to certain types of drinks ... ... sold in certain types of packaging (type and size)

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 ...

• 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

From 0.1 to 3 l

Materials covered:
- Metal
- Glass
- Plastics

1) See appendix for a detailed description.

Source: Packaging Ordinance
Existing dual system infrastructures are not being used – Operating a compulsory deposit system in parallel erodes efficiency

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

Source: Roland Berger, DSD, DPG
Introduction of compulsory deposits in 2003 triggered disruptions – some of them very pronounced – throughout the packaging market

Year-on-year changes in packaging consumption\(^1\), 2002-2005 [%]

<table>
<thead>
<tr>
<th></th>
<th>Paper, pasteboard, cardboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastics</td>
<td></td>
</tr>
<tr>
<td>10.8</td>
<td>4.0</td>
</tr>
<tr>
<td>5.4</td>
<td>3.4</td>
</tr>
<tr>
<td>7.9</td>
<td>2.5</td>
</tr>
<tr>
<td>2.0</td>
<td>-0.3</td>
</tr>
</tbody>
</table>

| Tinplate       |                             |
| -3.9           | -17.9                       |
| -5.6           |                             |
| -2.6           |                             |

| Aluminum       |                             |
| 0.3            | -3.1                        |
| -3.7           | -4.0                        |
| -6.3           | -1.6                        |

| Glass          |                             |
| 2.4            |                             |
| 2.4            |                             |
| 6.4            | -2.2                        |
| 10.4           | -0.3                        |

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

Source: GVM
In terms of environment policy, compulsory deposits do not meet the goals of the Packaging Ordinance

**Impact**

- Introduction of **compulsory deposits** significantly **accelerated** the destabilization of the reusable packaging system
- Reusable quota is falling **consistently**

- **Drinks packaging** accounts for only **6%** of littering, so no material impact
- The **majority** of litter in the form of non-packaging materials – wrappers??, cigarettes, etc. – remains **unaffected**

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

Source: Roland Berger, BMU
The various groups involved have had to shoulder huge investments and ongoing annual costs

System used to identify economic impact

<table>
<thead>
<tr>
<th>Groups involved</th>
<th>Parameters analyzed</th>
<th>Impact</th>
</tr>
</thead>
</table>
| • Retail        | 1 **Investment** to develop the deposit system  
• Assumption: Replacement investment is effected in each period  
Consequence: Interest charges do not decrease (conservative calculation)  
• Depreciation is based on useful life and is factored into the annual cost | Initial investment: EUR 726 m |
| • Industry      | 2 **Annual cost** to operate and maintain the deposit system  
• Assumption: Market volume of 14 billion disposable containers p.a. | Annual cost: EUR 793 m |
| • Bottlers      |                     |        |
| • Packaging manufacturers |                     |        |
| • Label printers |                     |        |
| • Can vendors   |                     |        |

Source: Roland Berger
Industry has to pay 33% of collection costs to handle just 7.3% of the total volume

Packaging collection in the private consumer segment in 2005

<table>
<thead>
<tr>
<th>Cost [EUR m]</th>
<th>Volume [000 t]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household-based collection (DSD, etc.)</td>
<td>Private consumers (including deposit-free drinks packaging)</td>
</tr>
<tr>
<td>33%</td>
<td>67%</td>
</tr>
<tr>
<td>1.460</td>
<td>5,086</td>
</tr>
<tr>
<td>711</td>
<td>401</td>
</tr>
</tbody>
</table>

Deposit-paying disposable containers 7.3% 92.7%

Source: DSD, GVM, Roland Berger
Compulsory deposits further destabilized the reuse system – Existence of a separate collection system led to inefficiencies in dual systems

1. Impact on retail and industry
   - Reusable packaging quota not stabilized
   - Investments necessary in systems to accept returned packaging and in a clearing system
   - Drivers for disposable drink packaging remain intact

2. Impact on the packaging collection 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 has had to be set up and operated at considerable expense

Source: Roland Berger
Compulsory deposits have not turned the tide for the share of reusable packaging – Brief improvement in 2003 only

Trend in the percentage of reusable drinks packaging

**WATER**
- 2002: 69.6%
- 2003: 71.9%
- 2004: 65.2%
- 2005: 53.2%
- 2006: 44.5%

**SOFT DRINKS**
- 2002: 53.4%
- 2003: 69.7%
- 2004: 66.9%
- 2005: 56.3%
- 2006: 45.0%

**BEER**
- 2002: 76.3%
- 2003: 91.3%
- 2004: 91.2%
- 2005: 88.5%
- 2006: 86.0%

Source: Roland Berger, GfK, packaging summit, Packaging Ordinance, wafg
Dual systems lead to recycling of 80% of disposable containers – Compulsory deposit systems realize the slightly higher rate of 95%

Recovery volumes by collection system [billion units]

<table>
<thead>
<tr>
<th>Use of disposable packaging</th>
<th>Recovery via household-based system</th>
<th>Recovery via compulsory deposit system</th>
<th>Improvement in recovery rate through deposit system</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>590 [000 t]</td>
<td>472</td>
<td>561</td>
<td>89</td>
</tr>
</tbody>
</table>

Notes

1. Recovering disposable containers via dual systems leads to a recycling rate of around 80%

DSD’s hollow body recovery rate stood at around 80% before compulsory deposits were introduced

2. Compulsory deposit systems can achieve around 95%

3. 15% increase is realized thanks to superior return levels
   - Deposit creates incentive to return containers
   - Containers that consumers throw away are returned via collection points

An extra collection system is needed to achieve this 15% improvement

Source: Roland Berger, DSD, interviews with experts
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]

- 2002: 6.3
- 2003: 5.9
- Volume erosion: -0.4

Sales [EUR m]

- 2002: 1,874
- 2003: 1,697
- Decline in license revenues: -250
- Excl. disposable container licenses

• Since **compulsory deposits** were **introduced** in 2003, the disposable containers concerned have no longer been collected **via household-based systems**

• Dual **systems are thus losing** around **400,000 t** of eminently **recyclable material a 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??

Source: DSD, press
Every extra drinks container collected by the compulsory deposit system costs 22 cents

Marginal cost analysis: household-based recovery versus compulsory deposits

<table>
<thead>
<tr>
<th>Volume [billion units]</th>
<th>Cost [EUR m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable packaging</td>
<td>100%</td>
</tr>
<tr>
<td>Household-based recovery</td>
<td>80%</td>
</tr>
<tr>
<td>Recovery via deposits</td>
<td>95%</td>
</tr>
<tr>
<td>Δ between the two</td>
<td>+15%</td>
</tr>
<tr>
<td>Material revenues</td>
<td>82</td>
</tr>
<tr>
<td>License fees from household system</td>
<td>250</td>
</tr>
<tr>
<td>Cost of deposit system</td>
<td>711</td>
</tr>
<tr>
<td>Δ between the two</td>
<td>461</td>
</tr>
</tbody>
</table>

Source: Roland Berger

Cost per container [ct]: 2.2, 5.3, 22.0
Compulsory deposits are not suitable as a tool to boost the proportion of reusable packaging

Trend in the proportion of reusable packaging in Germany, 1980-2006 [%]

Source: Roland Berger, GfK, packaging summit
The compulsory deposit model teaches us five key lessons

Compulsory deposits …

1. … cost around three times as much per container as household-based collection – Marginal cost of 22 cents/container for additional quantities

2. … diminishes the efficiency of household-based collection – Compulsory deposits mean that two collection systems must always operate in parallel

3. … alone are not the right tool with which to meet the requirements of the Packaging Ordinance – In Germany, disposable drinks packaging makes only a marginal contribution to the national recycling rate

4. … are not suitable as a tool to increase the use of reusable packaging

5. … do reduce litter caused by drinks packaging to some extent, but do not really help keep public spaces properly clean

Source: Roland Berger