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Refillables for sustainability:
Key facts and figures from the independent PwC-study on different types of beverage packaging

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Overview

• Who is Deutsche Umwelthilfe (DUH) and what does it do?
• Main findings of the study „Reuse and Recycling Systems for Selected Beverage Packaging from a Sustainability Perspective” carried out by PwC
Who is Deutsche Umwelthilfe (DUH) and what does it do?
Deutsche Umwelthilfe (DUH)

- Independent non-governmental organization (NGO)
- Nature and consumer protection
- Founded in 1975
- 85 employees
- 6,5 Mio EUR annual budget (2010), 30,000 sponsors
- Classical nature protection projects and policy campaigns
  - Deposit systems for beverage packaging
  - High standards for recycling (WEEE, packaging etc.)
  - Low sulfur fuels / Environmental zones
  - Renewable energy ...
Main findings of the study „Reuse and Recycling Systems for Selected Beverage Packaging from a Sustainability Perspective” carried out by PwC
Why another study about deposit systems?

• A lot of studies regarding deposit systems with false data and unrealistic assumptions on the market
• Certain industrial sectors have commissioned tainted studies arguing against deposit systems
• Most available studies focus either on environmental or on economic aspects of collection and recycling systems for beverage packaging
Taking stock of the past, taking reality into account: PwC study on deposit systems

- Reuse and Recycling Systems for Selected Beverage Packaging from a Sustainability Perspective
- Commissioned by the independent NGO Deutsche Umwelthilfe
- Carried out by the auditing and consulting organization PricewaterhouseCoopers (PwC)
- For the first time a sustainability check on systems for collection and recycling of beverage containers
A global PwC team effort

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Scope of the PwC study

• Three different systems for collection and recycling
  – Refillable bottles (with deposit)
  – One-way (single use) beverage containers with deposit
  – One-way beverage containers in curbside collection systems (no deposit)
• Different kind of beverage packaging
  – Glas bottles (refillable and one-way)
  – PET bottles (refillable and one-way)
  – Beverage cans
  – Beverage cartons
Evaluation model in the PwC study

• 10 ecological impact categories with 16 indicators; e.g.
  – Resource and material use
  – Collection and recycling rates
• 8 economic impact categories with 19 indicators; e.g.
  – System costs and revenues
  – Impacts on businesses and competition
• 6 social impact categories with 9 indicators; e.g.
  – Employment
  – Implementation of producer responsibility
Evaluation model in the PwC study

- System’s influence on the indicator is very positive
- System’s influence on the indicator is predominantly positive
- System’s influence on the indicator is slightly positive or negative
- System’s influence on the indicator is predominantly negative
- System’s influence on the indicator is very negative
Main findings of the PwC study

• Refillable systems are more sustainable than one-way systems

• Deposit systems are more sustainable than curbside collection of beverage containers

• Deposit systems for beverage containers enable higher collection rates and better recycling

• Deposit system for one-way beverage containers is not more expensive than curbside collection

• Deposit system for one-way beverage containers is more cost efficient than curbside collection

• Deposit systems and curbside collection can coexist well

• Political measures (in addition to deposit on one-way containers) are necessary to promote refillable systems
PwC: Refillable bottles are best in class

- In all three pillars of sustainability refillable bottles beat one-way beverage packaging systems, e.g. in the categories
  - Resources use
  - Global warming
  - Ecological packaging design
  - System costs
  - Start-up difficulties
  - Product diversity
  - Employment
  - Implementation of producer responsibility
Refillable bottles for waste prevention

- Refillable bottles are often heavier than one-way beverage packaging.
- Due to the multiple use, they need less packaging material per product and produce less packaging waste.
Refillable bottles for waste prevention

1 refillable glass bottle (0.5 liter) replaces 42 beverage cans (0.5 liter)
Refillable bottles for waste prevention

1 refillable glass bottle (1 liter) replaces 46 beverage cartons (1 liter)
Refillable bottles for waste prevention

kg packaging material per 1,000 liter product

<table>
<thead>
<tr>
<th>Container Type</th>
<th>Material</th>
<th>Volume</th>
<th>Packaging Material kg</th>
<th>Waste Reduction %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refillable bottle</td>
<td>Glass</td>
<td>0.5</td>
<td>27</td>
<td>+69%</td>
</tr>
<tr>
<td>One-way Alum. cans</td>
<td></td>
<td>0.5</td>
<td>45.5</td>
<td>+182%</td>
</tr>
<tr>
<td>One-way Steel cans</td>
<td></td>
<td>0.5</td>
<td>76.1</td>
<td></td>
</tr>
<tr>
<td>Refillable bottle</td>
<td>PET</td>
<td>1.0</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>One-way PET can</td>
<td></td>
<td>1.0</td>
<td>34.8</td>
<td>+266%</td>
</tr>
<tr>
<td>Refillable bottle</td>
<td>Glass</td>
<td>1.0</td>
<td>30.4</td>
<td></td>
</tr>
<tr>
<td>One-way Bev. carton</td>
<td></td>
<td>1.0</td>
<td>42.2</td>
<td>+39%</td>
</tr>
</tbody>
</table>

Source: DUH on the basis of data from PwC, 2011
PwC: Deposit achieves much higher collection and recycling rates than curbside collection

- Collection and recycling rates for refillable glass bottles with deposit in Germany

  - Put on the market: 100%
  - Collected (including rests and adhesions): 99%*
  - Net collected (without rests and adhesions): 99%*
  - Recycling rate: > 99%*
  - Closed-loop recycling: > 98%*
  - Energy recovery (of paper labels): < 1%*
  - Open-loop recycling (of lids): < 1%*

Source: PwC, 2011

* Compared to the amount of packaging put on the market
PwC: Deposit achieves much higher collection and recycling rates than curbside collection

- Collection and recycling rates for PET refillable bottles and PET one-way bottles with deposit in Germany

* Compared to the amount of packaging put on the market

Source: PwC, 2011
PwC: Deposit achieves much higher collection and recycling rates than curbside collection

- Collection and recycling rates for PET one-way bottles in curbside collection system in Germany

* Compared to the amount of packaging put on the market

Source: PwC, 2011
PwC: Deposit systems enable not only more, but also better recycling

• In the deposit systems all collected materials are recycled.
  – “Clear” PET from deposit system: 460-530 EUR / t

• The materials collected in the curbside collection are worse in quality and only partly recycled.
  – “Clear” PET from curbside collection: 275-320 EUR / t

• The quality of the PET from the curbside collection is not good enough to enable bottle-to-bottle recycling
PwC: Deposit systems are not more expensive than curbside collection

• Earlier analyses arrived at the finding that the deposit system gives rise to higher costs.
• Current data indicates that developments are tending to favour mandatory deposit systems and that participation in a deposit system can be less costly than participation in a green dot system.
• In Germany, the costs for the one-way deposit system are (under realistic assumption) 14 % lower than for the curbside collection system (green dot system).
PwC: Deposit systems are more cost efficient than curbside collection

Cost for deposit system only 40-70% of the costs for curbside collection assuming same collection rates.

- Deposit system with old (Berger) assumptions and low weights
- Deposit system according to new PwC survey and high weights
- Curbside collection, low weights, recycling rate 99% linear projection
- Curbside collection, high low weights, recycling rate 99% linear projection
PwC: Differentiated view of total system costs for one-way and refillable systems

- Total costs for **beverage producers** are 43-46% lower for refillable systems than for one-way systems
- Total costs for **retail** depending on packaging unit, line of business and the take-back logistics
- Altogether the **total system costs** for refillable systems seem to be lower compared to one-way systems
PwC: Deposit systems and curbside collection can coexist very well

- Mandatory deposit systems and green dot systems for single-use beverage containers are aimed in part at different segments.
- The two systems supplement one another and can co-exist very well.
PwC: Refillable systems need political support

• Deposit systems contribute to achieving the following political targets:
  – High collection rates (up to 98,5%*)
  – High recycling rates (up to 98,5%*)
  – High recycling quality (*bottle-to-bottle and closed-loop recycling*)
  – Reduction of littering

• Deposits on one-way beverage packaging alone does not secure high refillable quotas. Political steering instruments promoting refillable systems are needed.

* Based on the amount of packaging put on the market
PwC: Refillable systems need political support

- PwC recommendations for achieving high refillable quotas in Germany (in addition to the one-way deposit):
  - Clear labeling of one-way an refillable packaging
  - Unification and extension of the one-way deposit
  - Information campaigns
  - Improved data
  - Accreditation of refillable systems
  - Incentive levy for ecologically disadvantageous types of beverage packaging
  - Appropriation of the revenues from the incentive levy (e.g. direct financial benefits for environmentally advantageous beverage packaging such as refillable bottles)
Thank you very much for your attention!

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