**Deposit systems for one-way beverage containers increase the environmental impact of packaging waste collection systems. (A study from BIO Intelligence Service for APEAL).**

## 15 Questions and Answers :

***Q1. What collection systems did you analyse?***
A1. We analysed two systems of collection. The first one is a multi-material kerbside collection system for all packaging, except glass, the latter being collected separately through glass igloos. The second one is a combined system in which a separate deposit system exists for all one-way beverage containers, in parallel to the first system mentioned above.

***Q2. What are the key drivers that have a significant influence on the final cost-efficiency profile of the different collection systems?***
A2. These drivers are: the collection rates generated by the combined system, the space costs and sales losses at retailers' locations in the combined system, the collection distances, and the allocation of the number of runs made by consumers in their personal cars to bring back to the shops their empty one-way beverage containers.

***Q3. Why did you carry out a sensitivity analysis on these key drivers?***
A3. It is essential that the eco-efficiency of a collection system is not only evaluated for one value per key parameter, but for a range of values, so that different local circumstances can also be accounted for in the analysis. A sensitivity analysis gives a more objective and correct view of the eco-efficiency of the collection systems under review.

***Q4. What is the precise scope of the analysis that BIOIS has performed?***
A4. The analysis has voluntarily been limited to the collection systems only. There is therefore no integration either upstream or downstream with the recycling step itself. The aim was indeed to focus the analysis on this crucial step of the collection process that has up until now never been analysed under the three key dimensions of environmental impact, costs and efficiency. This needed to be done, and now it has been.

***Q5. What is the purpose of this analysis?***
A5. It was set against a context where global warming is on every political agenda, the fact that global warming and $CO_2$ emissions undoubtedly have a link with transportation and that collection of used household packaging is mainly about transportation. APEAL thought it interesting to check whether what we had always believed about adding a deposit system for one-way beverage containers to an existing, well functioning, multi-material collection system, financed notably through the "Green dot" system, was scientifically proved to be nonsense. Indeed it proves that such an approach does add to the environmental burden, without increasing efficiency at a cost that is more or less double.

***Q6. What are the initial hypothesis made for each of the key parameters?***

A6. These are for the following collection rates: 60% for the kerbside multi-material collection system, 70% for the glass bring back system, and 80% for the one-way beverage containers deposit system. For the cost of space at retailers' locations a cost of 9€/$m^2$/month was taken. The sales losses at retailers' locations due to the space needed for the reverse vending machines and storage has been evaluated from 280 to 1250 €/$m^2$ occupied. For the distances between the collection points and the sorting plants in the multi-material collection system, we took 50 km (0.5 day / week). Under the one-way beverage containers deposit system, we have assumed that consumers make 0.3 trip per week to the shop (which is very low). Only 20% of the environmental impact of the 0.3 trips per week are allocated to the return of the one-way beverage containers. The remaining 80% of the environmental impact of the trips are not taken into account since they are linked to other activities (Shopping etc…). A detailed sensitivity analysis for each environmental indicator is performed and exposed in the final report to show what the results of the study would be if these assumptions were changed (See section 3.3.4 (p. 32) and Appendix 9 (p.60) of the final report).

***Q7. Could you illustrate by a simple example what adding a deposit system to an existing multi-material collection system means in terms of increased environmental burden?***

A7. Adding a deposit system for one-way beverage containers to an existing multi-material collection system increases $CO_2$ emissions in a proportion that is comparable to that of putting an extra 500 to 700,000 cars on the roads of Europe, each car travelling an average of 10,200 km per year.

***Q8. What is the credibility of BIOIS the consulting company that carried out this analysis for APEAL?***

A8. The personnel of BIO Intelligence Service have extensive experience in this specific double area of Life Cycle Assessment and collection systems for used household containers, as they have already worked on a number of related studies when they were still consultants at TN SOFRES, such as the "Cost benefit analysis of packaging waste management systems in Europe – case studies for France, Germany, The Netherlands, and the UK", 2000, carried out by TNS for the European Commission – DG Environment. BIO Intelligence Service was also involved in 2003 in a study for the European Commission concerning the "external environmental effects related to life cycle of products and services".

***Q9. What is APEAL?***

A9. APEAL is the European trade association representing the Steel for Packaging producers. The members of APEAL that have plants in Slovakia, Serbia, France, Spain, Belgium, The Netherlands, the UK, Norway, and Germany represent 92% of the total European steel for packaging production. These members are US Steel Kosice, Arcelor Packaging International, Corus Packaging Plus, and Rasselstein.

***Q10. What are the key results of this analysis?***
A10. This environmental and cost-efficiency analysis carried out by BIOIS clearly recommends against implementing a deposit system for one-way beverage containers in addition to an existing multi-material selective collection system.

***Q11. What kind of packaging is covered by this analysis?***
A11. This analysis covers exclusively all one-way packaging, whether beverage or other. It includes all one-way packaging materials too. The study is looking exclusively at the collection systems for one-way packaging (as opposed to refillable packaging). Therefore, no conclusion of this study should be applied to existing collection systems for refillable drinks containers.

***Q12. What are your main data sources for this analysis?***
A12. Data representing an average European situation in 2004 was entered into the simulation tool. The data for multi-material collection systems is based on observations of existing collection systems in France, Belgium, and Germany. The combined system is a theoretical system where all kinds of materials used for beverage packaging are accepted in the deposit system: steel and aluminium cans, plastic and glass bottles, beverage cartons. Technical data on automatic deposit machines is derived from data about machines used in the Nordic countries; all other data being similar to that used for the multi-material collection system.

***Q13. What are the environmental themes that BIOIS took on board for this analysis?***
A13. BIOIS took into account 8 environment themes, each of which have an equal weight in the positioning: depletion of non renewable resources, primary energy consumption, greenhouse effect (direct 100 years), photochemical oxidation, stratospheric ozone depletion, human toxicity, aquatic ecotoxicity, municipal and industrial waste. These themes have been chosen because they fit today's political agenda. Public authorities and citizens are more and more attentive to the issues of air quality, climate change, waste management, depletion of non-renewable resources, etc.

***Q14. Give me a precise definition of the collection rate, as this is an important factor in the BIOIS analysis.***
A14. The collection rate defines the efficiency of the system, it is the percentage of recyclable packaging waste collected versus the amount available for collection (according to collection scheme requirements). It reflects the participation of the citizens in the selective collection of packaging waste as well as the quality of their sorting.

***Q15. Why did you include the beverage cartons in the deposit system when these are usually not included?***
A15. Beverage cartons (e.g. Tetra Pak containers) are also one-way beverage containers like any other container in that segment. Drinks cartons are generally in smaller formats than cans, adapted to on-the-go consumption habits and the needs of small children. Therefore, there is no reason not to include them if a deposit system is imposed on plastics, glass and metals drinks containers.