



The 6th International Conference on Life Cycle Management in Gothenburg 2013

## **PACKAGING - FROM SINNER TO SAINT ... IN JUST 20 YEARS**

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*Keywords: food-waste, packaging, LCA, sustainable*

### **ABSTRACT**

Packaging - From Sinner to Saint ... in just 20 years: A resource efficiency story about the absolution of packaging as it is increasingly recognized for the role it plays in helping society to manage the resources it uses more efficiently. The poster presentation uses 3 food packaging LCA studies (wine, goulasch soup, coffee) packed in either alufoil, flexible packaging or both to illustrate where the real environmental impacts are. Also, how a greater awareness and understanding of the role played by the pack is contributing to it's absolution as "the sinner" and being increasingly seen as part of the solution to reducing food waste – enter the "saint".

### **PACKAGING – A BRIEF HISTORY OF RECENT EVENTS PRE 1990**

In the latter half of the 20<sup>th</sup> century consumer attention was increasingly focused on the "mountains" of packaging waste either being buried in landfills or burned, potentially releasing harmful substances. The realization that Europe was running out of landfill capacity combined with the potential risks/issues from uncontrolled burning of waste which included packaging, resulted in the demonizing of packaging as the "Sinner of the 20<sup>th</sup> century". Positively, it also resulted in the German Packaging Ordinance (implemented as the DSD) in 1990 and the EU's Packaging & Packaging Waste Directive in 1994.

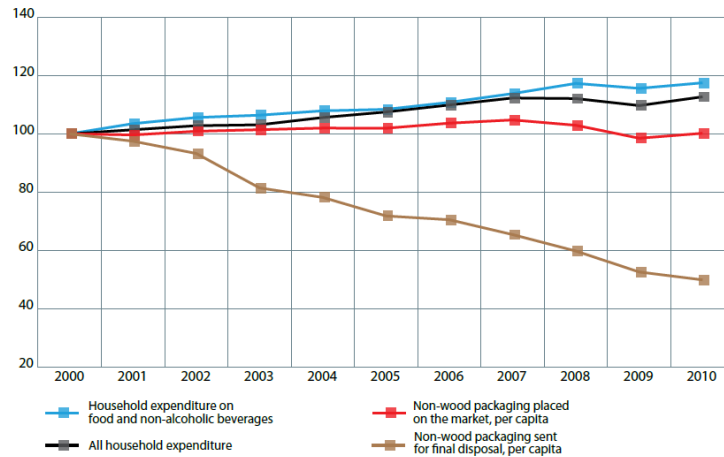
### **20 YEARS LATER ...AND A LOT OF PROGRESS!**

From this "pit of public opinion", all parts of the packaging and related industries have worked to progressively and collaboratively decouple packaging waste from economic growth; by lowering pack weights and by developing increasingly sophisticated packaging collection, sorting and recycling systems for all packaging materials.

The establishment of reliable LCI data for all packaging materials combined with the coming of age of Life Cycle Assessment (LCA) has gradually enabled a better understanding of the full lifecycle impacts of products hereby making the value added by the pack more visible. The phenomenal development in packaging waste management technologies has demonstrated that realizing the Cradle to Cradle dream, so key to a resource efficient society, is not only possible but is gradually being realized by several materials including aluminium.

The 2013 EUROPEN publication (see Figure 1), based on Eurostat data reported by the Member States, clearly shows not only the decoupling of packaging waste from household expenditure, but also that 65% of the packaging placed onto the market in the EU-15 was collected and recycled when compared with a 2000 baseline.... let alone using 1990 as the baseline!

Figure 1: Trends in household expenditure, packaging consumption and packaging disposal in EU-15, indexed to 2000



- The amount of used packaging sent for final disposal is declining rapidly, as recovery rates – and particularly recycling rates – continue to increase. In 2010, 65% of the packaging placed on the market in EU-15, and 47% of the packaging placed on the market in the newer Member States, was recycled.

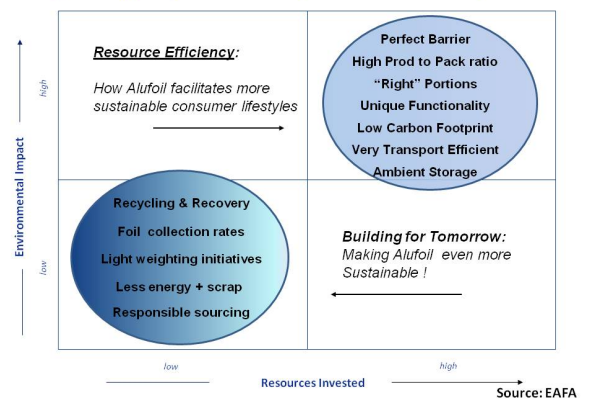
## RESOURCE EFFICIENCY

Recently, increased collection and recycling of packaging has gradually evolved into a focus on resource efficiency as society recognizes the need to live more sustainably; resource efficiency not only of packaging materials but also of the product it protects – especially food. The use of LCA to quantify the environmental impact of different resources is leading to a better understanding of the role of packaging and the value it adds in helping consumers to live more sustainable lifestyles.

EAFA, the European Aluminium Foil Association and FPE, the European Flexible Packaging Association have carried out a number of LCA studies done by credible external LCA agencies with the objective of further building the understanding the role of aluminium and flexible packaging in facilitating greater resource efficiency e.g. through better protection of the product.

Figure 2 shows schematically the conclusions of those studies; namely that a relatively small investment in aluminium foil or flexible packaging protects a far larger resource investment in the product and reduces the risk of potentially increasing the overall environmental impact if the packaging was not effective.

Figure 2: Supporting Resource Efficiency – The Alufoil Sustainability Framework



Source: EAFA

## GOULASCH SOUP

To illustrate the relative investment in packaging to product, EAFA/FPE had a study done by ESU Services to quantify the relative environmental impacts of a goulasch soup packed in a multilayer stand-up pouch. Using a disposal scenario typical in a European situation (51% incineration with energy recovery, 42% recycling, 7% landfill) the study showed the ingredients to contribute 63% of the systems Cumulative Energy Demand (CED) whilst the packaging CED was only 12%! (distribution 6%, transport 11%, preparation 8%). This difference was even greater for the other LCA midpoint indicators such as Climate change 73%/8%, Ozone depletion 69%/8%, Terrestrial acidification 92%/3%, fresh water Eutrophication 86%/4%.

Another way of looking at it is that the 12% (CED) investment in packaging ensured the 63% invested in the goulasch soup ingredients was able to be eaten as intended avoiding food waste!

## REDUCING COFFEE WASTE THROUGH BETTER PACKAGING

Another LCA study done by ESU services for FPE on two types of coffee packaging showed that, in some usage occasions, increasing the amount of packaging material actually reduced the amount of coffee that was wasted and consequently gave a lower overall environmental impact!

The study compared a 500g pouch of filter coffee where the packaging represented just 1.5% of the carbon footprint per cup of coffee with an equivalent “stick pack” of instant coffee where the packaging represented 8% of the carbon footprint per cup.

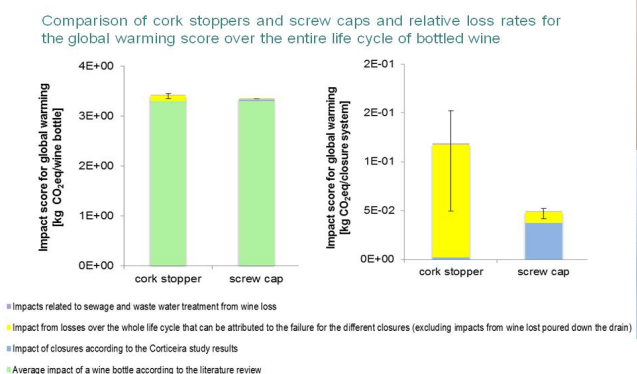
When the study factored in that in a typical meeting situation on average c.a. 30% of the filter coffee brewed was never consumed, the stick pack carbon footprint and overall environmental impact was considerably lower than the “pouch pack” despite having more packaging.

This study clearly demonstrates both the need to take the usage situation into account and the packs ability to effectively portion to reduce food waste and lower the overall environmental impact.... even though this may require more packaging.

## IMPROVED WINE PROTECTION LEADS TO A LOWER ENVIRONMENTAL IMPACT.

Another EAFA study compared the performance of cork and aluminium screw caps for wine. It is estimated by wine experts that between 2% and 5% of all wine packed in glass bottles sealed with cork does not meet quality expectations due to it's so called “corked taste”. Most often this failure

Figure 3: Influence of wine loss rate on the overall environmental performance





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of the closure system results in the wine not being consumed and disposed of.

In Figure 3 the study done by Quantis comparing this impact with the recorded lower “wastage” level of aluminium screw caps (0.2% - 0.5%) shows that the wines packed with an aluminium screw cap have a lower overall environmental impact for most of the LCA mid-point indicators despite the higher impact of the aluminium screw cap relative to a cork equivalent.

## DISCUSSION

These 3 examples show that 1) packaging contributes a relatively minor part of the overall environmental impact when the whole product system is considered and 2) that this small investment in packaging actually saves resources by effectively protecting the product so that it can be consumed as intended.

The studies also demonstrate that the packaging system needed to protect the product is situation dependent and that the relative differences in product/food that will be wasted in these situations needs to be included when specifying the pack.

## CONCLUSIONS

Over the last 20 years, the huge progress made in collection, recycling and recovery rates together with improved recognition for role the pack plays in conserving resources (and minimizing the impacts of our consumption) is evidence that packaging has come a long way from being the “Sinner of the 20<sup>th</sup> Century”.

However, whilst packaging has not yet formally been proclaimed the “Saint of the 21<sup>st</sup> Century”, we argue that it is well on it’s way provided this impressive progress is continued. The Aluminium Foil and Flexible Packaging industries realize that there is still work to do make packaging even more sustainable and are actively working to further improve the resource efficiency of the packaging materials and systems they develop.

*The pack’s sustainability journey is not over yet! And probably never will be!*

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