



---

# Resource Efficient Packaging

Executive summary of final report

commissioned by Flexible Packaging Europe (FPE)

Frank Wellenreuther

Heidelberg, November 2016

---

A recent study on the potential packaging waste prevention by the usage of flexible packaging and its consequences for the environment done by the Institute for Energy and Environmental Research (ifeu) for Flexible Packaging Europe (FPE) in 2014 showed that the substitution of non-flexible packaging by flexible packaging would significantly reduce the amount of primary packaging waste in Europe and also benefit the environment in regard to climate change and resource consumption, despite of significantly lower recycling rate for flexible packaging. It also revealed a close connection between waste prevention and resource efficiency.

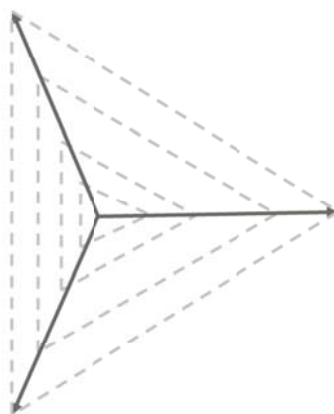
This study aims to define resource efficient packaging and to develop a method for measuring the resource efficiency of packaging. This definition and methodology could serve to support waste reduction through prevention and increase resource efficiency both of which are priorities in the European Union's environmental strategy.

To assess packaging resource efficiency in the context of the Circular Economy, a three metric model is proposed:

- Cumulated Energy Demand (fossil and nuclear energy)
- Cumulated Raw Material Demand (including energy resources and feedstock material)
- Waste for disposal (landfill or incineration)

The model is presented as a three-sided graph:

Cumulated **Energy** Demand



Cumulated **Material** Resource Demand

**Waste** to final disposal  
(not recycled)

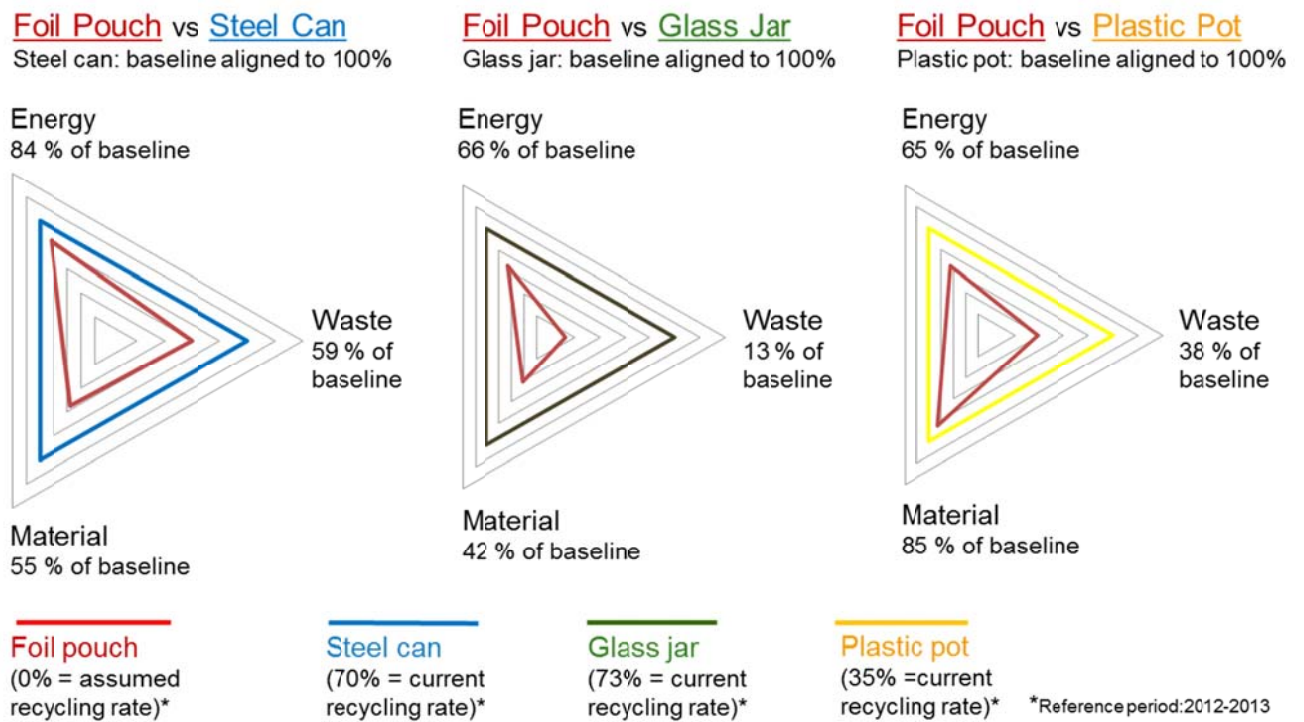
Resource Efficient Packaging would therefore be defined as a packaging solution combining the minimised use of material and energy throughout its lifecycle with the minimized amount of material losses (meaning not recycled).

Although this metric is primarily a relative metric to compare the resource efficiency of different packaging systems performing the equivalent function, it can also be used

to compare the performances of different average packaging mixes. Both types of comparative assessment are applied in the study.

In the study a laminated flexible pouch packaging solution for 460 ml long-life pasta sauce is compared to three alternative non-flexible packaging systems; a steel can, a glass jar, and a plastic pot. The results reveal that the laminated pouch solution (taking into account the complete packaging system including also secondary and tertiary packaging) was more resource efficient in all three metrics than the alternative solutions despite the pouch assuming a zero-recycling rate.

The following figure shows the results of the three comparisons:



The other case studied is the comparison of the average flexible packaging system mix currently used in Europe for fast moving consumer goods (FMCG) relative to a baseline representing all FMCG packaging in Europe. The results show significantly higher performances for flexible packaging system on all three-regarded metrics as compared to the average European packaging and highlight the resource efficient superiority of flexible packaging despite the unfavourable recycling rate. The clear superiority of flexible packaging is still valid when the compared European packaging baseline is

modelled with the 2025 ambitious recycling rate targets proposed by the European Commission.

An integrated metric such as the one being proposed to quantify resource efficient packaging, is a robust indication of the overall resource efficiency of a packaging system.

The proposed packaging resource efficiency indicator allows the overall waste prevention opportunity to be quantified for each respective packaging format hereby enabling the more resource efficient solution to be selected.

The one dimensional recycling rate metric used today only indicates the percentage of the packaging being recycled end of life and not which of the equivalent packaging systems uses less resource. As such the recycling rate metric should not be considered as a relevant proxy for “Resource Efficiency” by packaging legislation.

In summary, in the move to a more resource efficient Europe and where there is often a choice of packaging solutions for the same function, the resource efficiency metric and definition proposed by this study allows for robust conclusions on the resource efficiency of comparative packaging solutions that are not possible using the widely available recycling rate indicator.