



STYROLUTION PS

Economical, environmentally sound, eco-efficient



Driving Success. Together.

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A plastic at its birthplace – this holds true for Styrolution's polystyrene. Created for serial production in Ludwigshafen back in 1931, polystyrene has conquered the whole world since then. In fact, today Styrolution is among the leading manufacturers of polystyrene, be it standard or impact-resistant. Especially when it comes to packaging for food products, Styrolution's polystyrene works wonders in partnerships between Styrolution and its customers. With its particularly good cost-benefit ratio, this product can meet a wide array of the requirements made of disposable packaging.

And anyone who has been in business as long as Styrolution has knows that it is that something extra that counts, namely, technical expertise, worldwide delivery capability, constant product quality, continuous improvement of the product and the eco-efficiency analysis, which is an instrument that shows how polystyrene meets the requirements made of sustainable development.



WHAT IS AN ECO-EFFICIENCY ANALYSIS?

An eco-efficiency analysis takes both environmental and economic aspects into consideration

What is the best choice for environmentally aware consumers? What should the products of the future look like from an environmental and economic standpoint? The eco-efficiency analysis is an important instrument in the search for answers to these questions. With this analysis, both economic and environmental aspects can be considered during the development and optimization of products and processes so that the most eco-efficient variant can then be selected. The objective is to create products that can be optimally utilized and that display good environmental behavior and, last but not least, at a fair market price.

The core elements for assessing eco-efficiency are the consumption of raw materials and energy, the optimal characteristics of use as well as aspects pertaining to recovery and disposal. For this purpose, the environmental and economic pros and cons of competing products are compared. The vantage point of consumers and end users serve as the yardstick. That is why the analysis does not compare specific raw materials with each other, but rather final products that fulfill the same function.

EXAMPLES OF ECO-EFFICIENCY ANALYSIS

Task 1: To package 500 grams of yoghurt

An essential consideration in an eco-efficiency analysis is that the products or processes being studied have to fulfill equivalent functions for the customer – in this case, to package 500 grams of yoghurt for the German market. The alternatives to polystyrene are glass and Mixpap™, a combination of cardboard and plastic. Glass is employed almost exclusively in the form of reusable jars, while the other types of cups make up disposable systems.

The life cycle of a yoghurt cup made of polystyrene starts with its production from crude oil and natural gas (Figure 1). Intermediate steps then yield polystyrene granules, which are further processed into cups by means of deep drawing. The additional steps are filling, labeling, sealing, distribution of the filled cups, transportation of the empty cups as well as their recovery. The life cycles are similar for cups made of glass or Mixpap™. In the case of reusable glass jars, it can be assumed that the product goes back into circulation ten times. The analysis also included the burden entailed by the cleaning (detergents, disinfectants).

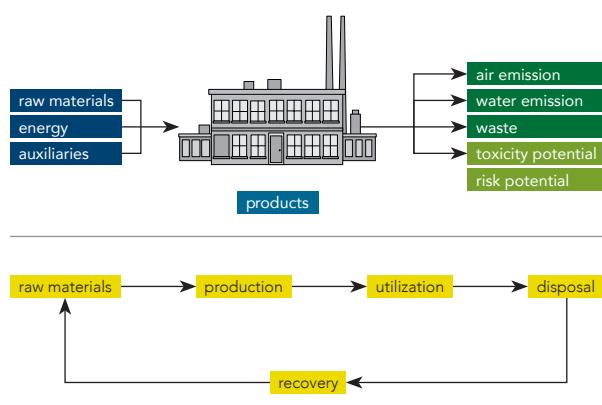


Figure 1: Product check – “From cradle to grave”
The entire life cycle is examined for each alternative

The result: Plastic cups come out ahead

The most interesting and most significant finding of the analysis is that all of the packaging studied is environmentally equivalent; there is no difference between reusable glass containers and disposable plastic packaging (Figure 2).

From an economic standpoint, packaging made of pure plastic such as polystyrene is way ahead, even though it entails high fees for its recovery. In this context, Mixpap™ has advantages since its treatment fees are lower. However, the higher production costs of Mixpap™ cups wipe out this advantage. With smaller containers, the advantages of plastic packaging are even greater.

An eco-efficiency analysis was also performed on plastic containers that hold milk products from the Müllermilch company (with the example of 500 ml). Here, too, plastic containers made of polystyrene likewise proved to be more eco-efficient than reusable glass or composite cardboard.

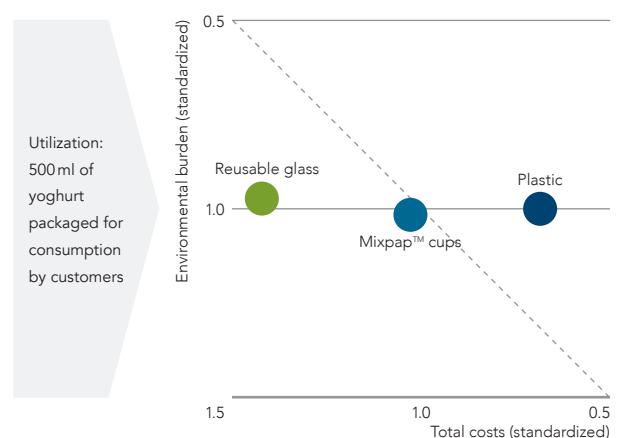


Figure 2: Result: yoghurt cups made of plastic are the most eco-efficient alternative

Task 2: To cater 400 meals

An eco-efficiency analysis for Germany examined the catering of 400 meals at an outdoor event, and compared service packaging made of polystyrene and cardboard to reusable plates and glasses that were cleaned in a mobile dishwashing unit.

The environmental effects, among others, are the following:

- With a breakage rate of 3-5%, reusable plates and glasses account for the highest burden in all categories.
At such breakage rates, a large number of glasses and porcelain plates have to be replaced and thus manufactured. This additional consumption of material has an impact in all categories.
- Service packaging generates the smallest amount of waste
The largest amount of waste is created by the broken plates, which then have to be disposed of in landfills. Service packaging, in contrast, is recovered in accordance with existing packaging regulations, so that it generates the least amount of waste at the end of its service life.
- Polystyrene plates and the like generate the least emissions
These emissions include discharges into the air, for example, from the burning of energy carriers as well as discharges into the water.

Polystyrene is more eco-efficient than reusable plates:

- All in all, service packaging is the more eco-efficient alternative.
- It offers clear-cut cost advantages at a comparable environmental impact.
- Service packaging offers advantages in some environmental categories, while reusable plates and the like come out ahead in other categories.

400 meals in the cafeteria

In contrast, if 400 meals are served in a cafeteria equipped with stationary dishwashers, reusable plates are the more eco-efficient alternative. In some categories, reusable plates are better for the environment than those made of polystyrene or of coated cardboard. The breakage rate of reusable plates and glasses plays a role here: if the breakage rates are very low, the reusable products offer advantages in major environmental categories, while in other cases service packaging is still better. In other words, what counts is the right choice for the given situation; service packaging is the better alternative for outdoor use.

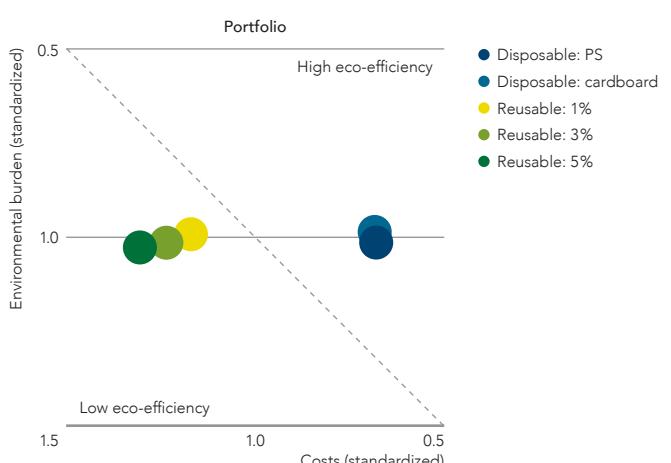


Figure 3: Service packaging for outdoor use is more eco-efficient than reusable plates and glasses

IS THE REUSABLE PRODUCT ALWAYS THE BEST PRODUCT?

Not all disposable products are the same.

Many people jump to the conclusion that reusable packaging is environmentally friendly, in contrast to disposable, or so-called service packaging. But things are not quite that simple. First of all, about 15 percent of all plastic packaging is already circulating in reusable systems. Secondly, lightweight disposable packaging made of plastic is, in fact, usually the better alternative, not only for consumers but especially for the environment.

For example:

- Already back in 1990, the Swiss retail chain Migros determined the environmental advantages of yoghurt cups made of plastic in comparison to reusable glass jars.
- In 1995, the Fraunhofer Institute conducted a study titled "On the environmental and waste-related evaluation of disposable and reusable packaging" involving dairy products (500-gram cups). Here, too, polystyrene obtained good results.
- In 1997, the Eco-Label Jury concluded that milk pouches made of plastic are allowed to bear the eco-label of the United Nations. They drew this conclusion from the eco-efficiency balance of milk packaging drawn up by the German Federal Environmental Office.

Small but great!

It has to be small, lightweight and flexible. But does small packaging make sense environmentally and economically? Studies conducted on this topic have demonstrated that small plastic packaging is both useful and economical and that it also makes an effective contribution to avoiding the generation of waste. This packaging was also found to make good sense from an environmental standpoint:



As single-portion packaging, this product prevents food spoilage.

Replacing larger packaging units with smaller ones helps not only the environment but also consumers. With the improved, fully automated machines used for sorting consumer packaging collected in the recovery systems, now even small packaging can be efficiently recovered.

It is clear: even small packaging made of plastic makes a great contribution to conserving resources.

Incidentally, if one were to replace all plastic packaging with packaging made of other materials, the weight of the packaging would increase four-fold, with the associated detrimental impact on costs and energy consumption.

OUTLOOK

The examples in this brochure show that Styrolution PS in the packaging sector is more eco-efficient than other materials in numerous applications. By the same token, disposable packaging often proves to be the more eco-efficient alternative in comparison to reusable packaging.

Generally speaking, demonstrating the sustainability of products and processes over their entire life cycle will play an ever increasing role in the future. Styrolution's eco-efficiency analysis can provide valuable information in this context and point out where the decisive differences between the various options lie. Consequently, this analysis is helping Styrolution to develop new products and is providing critical consumers with solid recommendations for their purchase decisions.





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