

COMBIBLOC ECOPLUS: NEW CARTON PACK WITH 28 PER CENT LESS CO₂

The plus for the environment: less CO₂, higher content of renewable raw material

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ABSTRACT

combibloc EcoPlus is an innovative and climate-friendly aseptic carton pack for liquid food that cuts down CO₂ by 28 per cent compared to a conventional 1-litre carton pack of the same format, thanks to a special new cardboard composite. This reduction in CO₂ has been confirmed by an independent, critically reviewed lifecycle assessment conducted by the Institut für Energie- und Umweltforschung (IFEU/Institute for Energy and Environmental Research) in Heidelberg, Germany. *combibloc EcoPlus* contains around 80 per cent wood fibre, which is obtained from wood, a renewable resource. *combibloc EcoPlus* improves the good environmental performance of the carton package and meets the expectations of customers in terms of increasing the resource efficiency and reducing the CO₂ footprint.

1. Introduction

Environmental performance of packaging has become a key factor in evaluation and decision-making for policymakers, the food industry, retailers and consumers alike. Thinking and acting in a way that is ecologically advantageous is an inherent part of SIG Combibloc's global corporate strategy, also. The aim is to strive on an ongoing basis to optimise the food and beverage cartons in terms of their environmental impact, while also maintaining the cartons' function in safeguarding the quality of the products they contain. As part of this process, SIG Combibloc develops and launches product innovations that are effective in helping to reduce the impact products have on the environment. One example of this is the innovative carton pack *combibloc EcoPlus* with screwcap.

combibloc EcoPlus from SIG Combibloc is an aseptic carton pack for liquid food that cuts

down CO₂ by 28 per cent compared to a conventional 1-litre carton pack of the same format, thanks to a special new cardboard composite. This reduction in CO₂ has been confirmed by an independent, critically reviewed lifecycle assessment conducted by the Institut für Energie- und Umweltforschung (IFEU/Institute for Energy and Environmental Research) in Heidelberg, Germany. *combibloc EcoPlus* contains around 80 per cent wood fibre, which is obtained from wood, a renewable resource.

Ralf Mosbacher, Head of Global Product Management at SIG Combibloc: "Our objective is to continuously improve our carton packs with respect to their environmental benefits, to make sure they continue to be among the most environmentally friendly packaging solutions for long-life packaged foods. In *combibloc EcoPlus*, we have developed a carton pack with a new cardboard composite that substantially reduces CO₂, while at the same time, of course, guaranteeing product quality and product

protection and also ensuring the food will keep for a prolonged period without refrigeration. The scientifically proven reduction in CO₂ is a substantial plus for the environment”.

To conduct the lifecycle assessment in accordance with internationally binding ISO standards, SIG Combibloc commissioned the Institute for Energy and Environmental Research (IFEU) in Heidelberg to analyse and evaluate the environmental impacts of *combibloc EcoPlus* when compared against a conventional SIG Combibloc carton pack of the same format. The IFEU is one of the most renowned environmental research institutes, with a clientele including government ministries, international environmental and conservation organisations, Germany's Federal Environmental Agency and numerous companies and corporations.



Figure 1

2. Background, goal and scope of the LCA

In the “Comparative Life Cycle Assessment of beverage cartons cb3 and cb3 combibloc EcoPlus for UHT milk” conducted by IFEU Heidelberg, a new packaging system was analysed, which was recently developed by SIG Combibloc primarily for UHT milk. In this beverage carton, a new barrier technology is used. This life cycle assessment evaluates the environmental impact of the ‘cb3 EcoPlus’ system and compares it with that of a firmly established alternative packaging solution. The study covers the West European market situation as observed for the EU 15 countries & Switzerland in 2009/2010. It was conducted in accordance with the relevant ISO standards (ISO 14040 and ISO 14044)

and accompanied by a critical review process; the full report can be obtained from commissioner (www.sig.biz/ecoplus).

According to the geographic and time scopes, the established ‘cb3 1000ml’ packaging system was chosen for comparison to the new the ‘cb3 1000ml EcoPlus’, based on the fact that it is SIG Combibloc’s beverage carton with the highest market relevance in Europe for 1-litre units of UHT milk (also referred to as ‘combiblocSlimline’). Both systems were regarded with and without caps, as this is an optional part of the primary packaging. For each packaging system, a base scenario was defined to reflect the most realistic combination of settings for the respective scope. Regarding the end-of-life phase, an average recycling rate for post-consumer packaging was applied as well as an average final waste disposal split (landfill/incineration) for Western Europe (EU15 & Switzerland). In order to provide indications on how (country-)specific end-of-life settings might influence the results, specially designed scenario variants were modelled and calculated.

A wide range of environmental impact categories and inventory level indicators were analysed. Those related to the use of resources are the ‘Use of nature’ (focussed on sealed land and area occupied by forest) and the consumption of ‘Fossil resources’ (energy carriers). The emission-related impact categories are ‘Climate change’, ‘Summer smog’ (‘photo-oxidant formation’), ‘Acidification’ and *terrestrial* as well as *aquatic Eutrophication*, furthermore ‘Human toxicity’ (using the PM10 and carcinogenic risk approaches). The following inventory level categories are included: ‘Primary energy consumption’ – both ‘total’ and ‘non-renewable’ – as well as ‘Transport intensity: lorry’.

In addition to the base scenarios and variants, a sensitivity analysis was conducted to verify the influence of the allocation factor applied for open-loop recycling, as this parameter is a theoretical (value-based) assumption. A normalization step was included to improve understanding of the relative importance of each single indicator result of the systems under study.

Based on the commissioner's special interest in a 'cradle-to-gate carbon footprint', this part of the life cycle was highlighted in an additional section of the report, documenting the relative difference between the two regarded packaging systems in terms of indicator results.

3. Results and conclusions of the LCA

A detailed analysis of the 'cb3 EcoPlus' packaging system's life cycle reveals that overall the major impact in all examined environmental indicators originate from the production – and in some cases also the end-of-life treatment – of the primary packaging's (material) components. The production of liquid packaging board and the plastic elements (sleeve component and closure) can thus be considered the areas with the most promising optimisation potentials. Furthermore, reducing landfill rates (further) would most likely improve this packaging system's overall environmental profile, with the end of life being especially relevant concerning 'Climate change' and 'Transport intensity – lorry'.

The comparison of the two examined packaging systems shows that for all environmental aspects that were regarded in this study, the 'cb3 EcoPlus' system's net results are more favourable than those of the firmly established 'cb3' beverage carton, except for 'Aquatic eutrophication' and 'Use of nature: forestry'. In these two categories, the opposite relation emerges, however the difference is only considered significant in the case of 'Aquatic eutrophication'. The cradle-to-gate excerpt delivers a similar picture: in the category 'Climate change' for example, which was of special interest to the commissioner, the 'cb3 EcoPlus' system's indicator result is 28.6% more favourable than that of the established 'cb3' system.

The robustness and validity of the results regarding the allocation factor used for open-loop recycling were confirmed by means of a sensitivity analysis.

4. New composite structure

With *combibloc EcoPlus*, the key factor in reducing CO₂ generation to this level is a new type of composite structure. A special grade of cardboard gives the *combibloc EcoPlus* carton pack its rigidity. In the new composite structure, the content of cardboard that is obtained from the renewable resource wood is around 80 per cent. The specific characteristics of the cardboard ensure the foods filled into the carton packs are protected from light. A special new, ultra-thin polyamide layer acts as a barrier to protect against flavour impairment and external odours. Added to this are fine internal and external layers of polyethylene. The internal polyethylene layer forms a liquid barrier for the product and the external layer keeps moisture out.

To begin with, *combibloc EcoPlus* will be used in the long-life milk and dairy products segments, and in the future the concept will be expanded to include aseptic carton packs for non-carbonated juice products. As a first step, *combibloc EcoPlus* is to be available for *combibloc Slimline* (1,000 ml). Further formats are planned.

combibloc EcoPlus carton packs can be processed using the standard filling machines from SIG Combibloc. All that is required is a one-off adjustment to the filling machine parameters. The filling machines from SIG Combibloc can fill standard carton sleeves as well as *combibloc EcoPlus* sleeves.

REFERENCES

www.sig.biz