

Food procurement by a city government and the role of LCA

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Introduction

Life cycle assessment (LCA) has proved to be a powerful tool for the environmental optimization of production processes of single products. However, it is difficult to apply detailed LCA studies to investigate several hundreds or thousands of products at once. The city of Zurich centrally organizes the procurement of about 1000 different food products for about 10'000 people in hospitals, retirement homes and other public institutions. A general aim of its policy is to reduce the environmental impacts of the governmental activities. LCA has proved to be a suitable method in order to assist this goal.

Goal and Scope

The total environmental impact of food purchases centrally organized by the city have been evaluated applying LCA data for single products and combining them in a simplified manner with the total purchase statistics. The methodology has been developed in a study accounting for the embodied greenhouse gas emissions of Switzerland [1].

Life cycle inventory analysis

A total balance of embodied emissions due to the purchase of food has been made. The analysis of the purchases is based on data of the estimated quantity of ordered food products. These data are linked with life cycle assessment (LCA) data of food products and product groups [2, 3]. Fig. 1 shows an example of the life cycle inventory and impact assessment for the purchase of dairy products. Rough assumptions have been made concerning transports, packages and distribution according to the methodology developed for assessing impacts of food purchases [4, 5]. The agricultural production of milk is responsible for most of the environmental impacts for this product group with respect to ecological scarcity points.

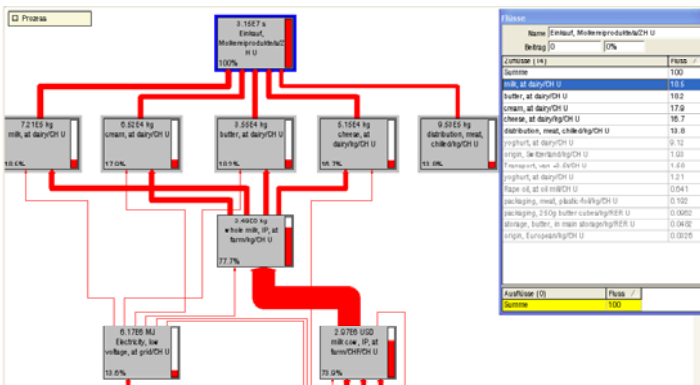


Fig. 1 Unit process raw data for annual purchase of dairy products and LCIA with the ecological scarcity method

Impact Assessment

The impact assessment has been evaluated for the cumulative energy demand [6], the greenhouse gas emissions (GWP-global warming potential) [7] and for environmental impacts based on the ecological scarcity method 2006 [8].

Fig. 2 shows the shares of weight, value and environmental impacts for different categories of food purchases. The evaluation on the basis of the ecological scarcity method highlights the importance of meat and dairy products for the overall impacts. Surprisingly, further products have also been identified as highly relevant, e.g. the purchase of coffee because of pesticide application during its growing. The results show some differences between total environmental impacts and energy demand or GWP only. For non-renewable energy use transport get more importance and thus heavy goods like beverages. For ecological scarcity pesticides used in coffee plantation have more importance. For GWP methane emissions of cows are important in the category of dairy products.

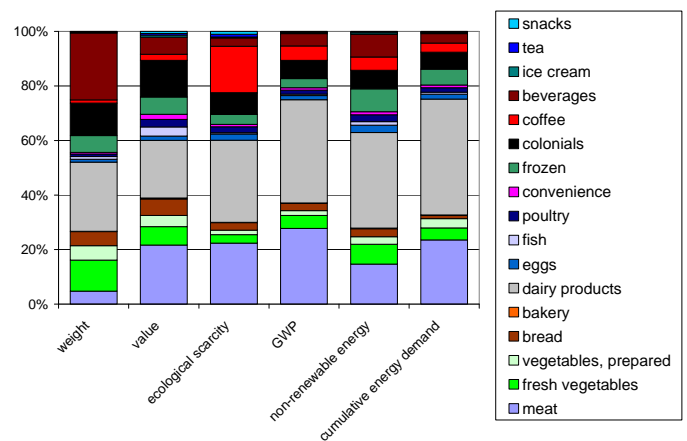


Fig. 2 Share of weight, value and different indicators for the food purchases of Zurich

Conclusions

Results of different LCA case studies have been used to propose issues relevant for environmental impacts of food provision to be considered in the call for tender of different product groups. In addition, suggestions for the reduction of environmental impacts are given to the persons responsible for food storage and preparation in the different institutions. Thus, LCA has been used in different ways to optimize the environmental performance in a large institution.

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