Considering the Environmental Impact in the Tactical Planning in the FMCG Industry

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Introduction

The traditional supply chain management goal of maximizing the profit while guaranteeing customer service levels is slowly changing. Improving the environmental performance has been identified as a method of increasing revenue and market share. Nevertheless, sustainability is rarely considered on the tactical planning level in the food industry in literature.

Objective

Integrate the environmental impact into the tactical planning model for the FMCG industry.

Method

Two objectives are included in the model: A cost minimization and an environmental impact minimization. The environmental impact is evaluated using the Eco-indicator 99 method. A set of Pareto optimal solutions is generated using the ε-constraint method.

Case Study

- Supply chain based in Europe
- Ice cream
- 52 weekly periods

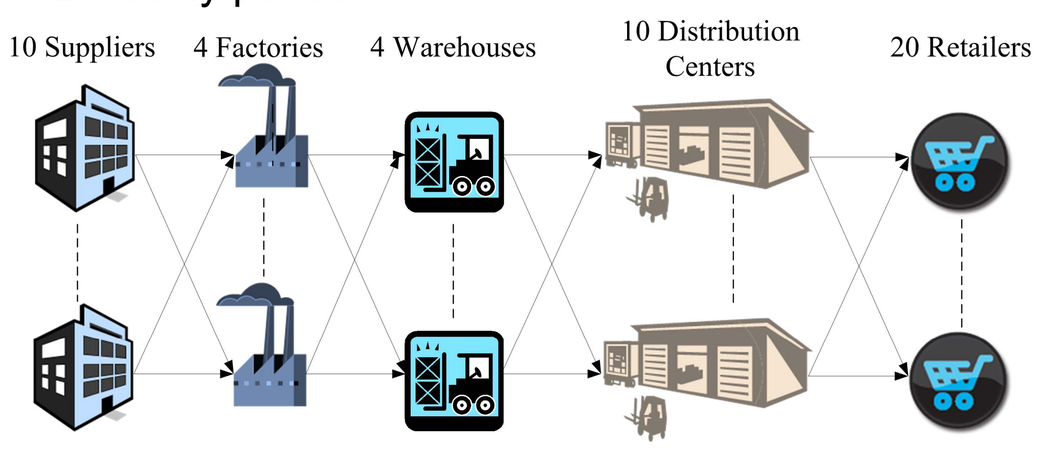

Figure 1: *Supply chain*

Environmental Impact

Ingredients: Two options are considered for the two main ingredients of ice cream.

	Non-Organic Milk	Organic Milk	Beet Sugar	Cane Sugar
Environmental impact [1-3] [ECO 99 units/t ingredient]	24.0	17.9	8.0	9.2

Transport: The environmental impact is approximated as 0.015 ECO 99 units/tkm based on a 40t truck with a 50% capacity load.[4]

Environmental Impact

Production: For ice cream, the main environmental impact of production is due to the energy consumption. The environmental impact depends on the energy mix, which varies per country.

	Austria	Belgium	Greece	Portugal
Environmental impact [4] [ECO 99 units/kWh]	0.018	0.024	0.062	0.047

Results

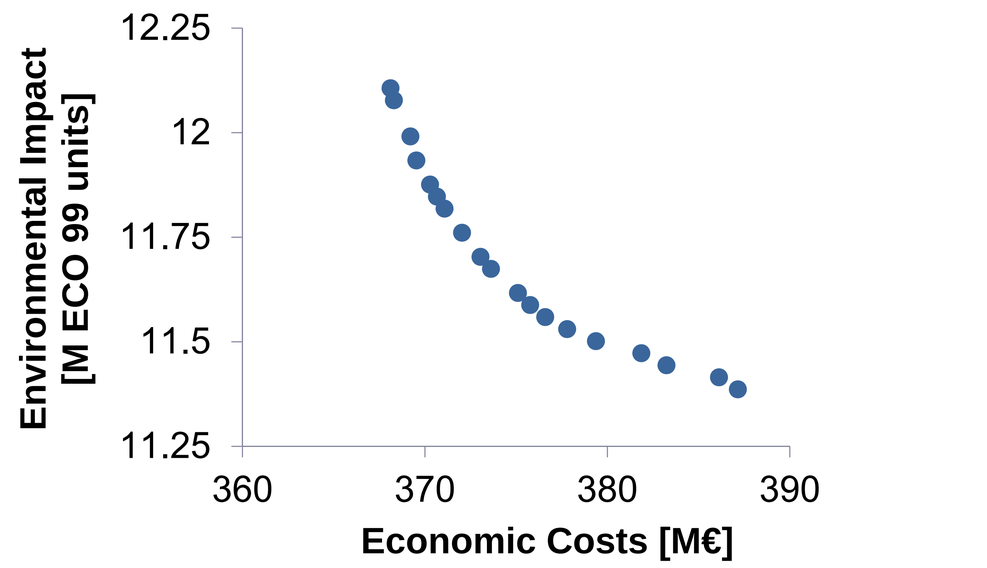

Figure 2: *Trade-off between environmental impact and costs*

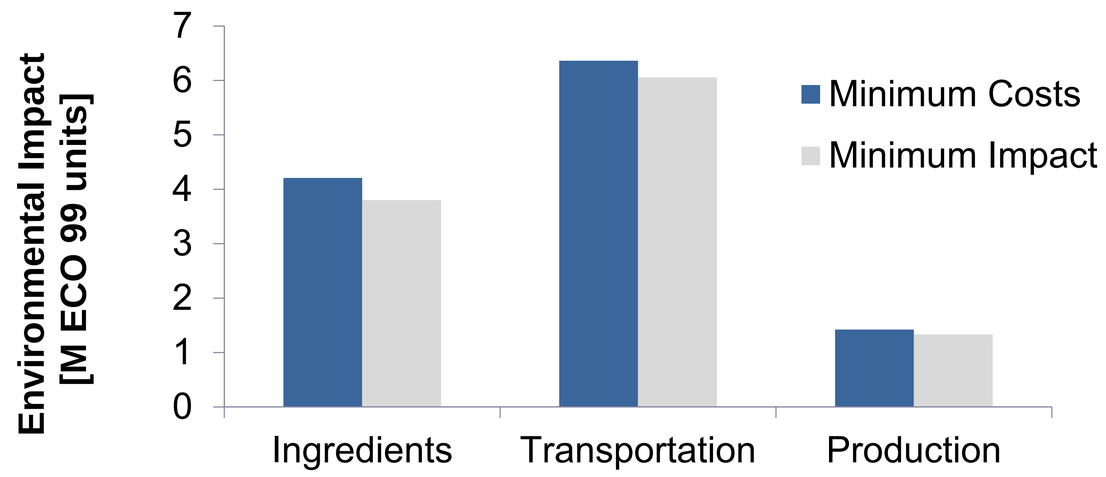

Figure 3: *Comparison of the environmental impact distribution for the minimum cost and minimum impact solutions.*

Conclusions

- Environmental impact can be reduced by up to 6.3%
- Procurement provides main opportunity to reduce environmental impact

Acknowledgements

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