

Simplified environmental assessment of food & drink products with the SENSE-tool: Challenges for SMEs



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Introduction

Life cycle thinking is important for enterprises since it allows them to focus on the main environmental aspects of their processes and products. According to the European Commission, 99% of all European enterprises in the private economy are small and medium-sized enterprises (SMEs). They usually do neither have the time nor the knowledge to conduct Life Cycle Assessments. If sustainable development in the food sector shall be fostered, SMEs have to be included and their knowledge strengthened.

Objective of the Project

The objective of the SENSE-project was to develop an easy to use tool that allows SMEs in the food sector to do a simplified environmental life cycle assessment of their products. The online tool should deliver the correct results and SME staff members should be able to use the tool correctly and understand the results.

Methods

A full LCA was conducted to identify the main inputs that contribute to the environmental burden of dairy products, orange juice and fish (salmon). Based on this assessment, the Key Environmental Performance Indicators (KEPIs) that are linked to key environmental challenges were chosen for each production step. They are simple to measure and easy to understand since they are built on accessible production data of the SMEs. On average, these indicators contribute to 95% of all environmental impacts of the respective food supply system [1]. As background data, ecoinvent data v2.2 [2] was used.

The impact categories in the SENSE-tool are a choice of the methods suggested by the ENVIFOOD Protocol as shown below: For water depletion, the "Ecological scarcity method is used instead of the method recommended by ENVIFOOD [3].

Impact category	Selected LCIA method	Indicator unit
Climate change	Bern Model – IPCC, 2007	kg CO ₂ eq
Eutrophication	Terrestrial: Accumulated Exceedance (Seppälä et al, 2006, Posch et al, 2008)	Terrestrial: molc Neq
	Aquatic: EUTREND Model (Struijs et al 2009b) as implemented in ReCiPe	Aquatic: Freshwater kg Peq Marine: kg Neq
Acidification	Accumulated Exceedance (Seppälä et al, 2006, Posch et al, 2008)	molc H ⁺ eq/unit of product
Human toxicity	USEtox Model (Rosenbaum et al, 2008)	CTUh (Comparative Toxic unit for humans)
Ecotoxicity	USEtox Model (Rosenbaum et al, 2008)	CTUe Comparative Toxic Unit for ecosystems)
Land use	Soil organic matter model	kg C deficit
Abiotic resource depletion	CML 2002 (Guinée et al, 2002)	kg antimony (Sb) eq
Water depletion	Ecological scarcity model (Frischknecht et al, 2009)	m ³ water-eq used related to average European scarcity of water

The SENSE-tool was programmed as an internet tool and links the background data with the KEPIs entered by SMEs. An SME can also invite its suppliers for entering data on their products. The online tool was tested by other SMEs. Ex-

perts checked the data entry and verified the accuracy of the results. The suitability of the tool to be used by SMEs was as well assessed with questionnaires.

Results & Discussion

Even though the data for the environmental assessment was reduced to the KEPIs, the collection of data – especially upstream the life cycle with many suppliers involved – is considered too difficult for the SMEs. Most of the testers did not invite their suppliers to insert their data as well. Even though the graphical user interface of the online tool is well programmed and simple, the correct entry of the data showed to be a challenge for the users. The guidance of experts is needed to achieve full standardization of data entries – most testers stated that the user guide is not sufficient to use the tool and a training course would be needed in addition [4].

The tool allows an easy calculation of key results per kg of product. Furthermore, it is possible to split up the results to different main input groups. Thus improvement potentials can be identified. The results obtained with the SENSE-tool were in the range with literature values of the same products if the users were assisted by the experts. This pie graph shows how the effect on the climate change for the production of milk is split into different production steps.

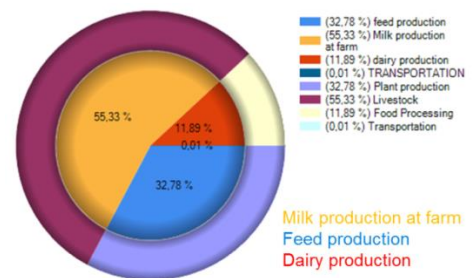


Fig. 1: Example of the display of results in the SENSE-tool

Conclusions

The SENSE-tool available on www.senseproject.eu is an easy to use online tool that can assist SMEs to assess their environmental impact. The tool cannot overcome the fact that product systems are typically rather complex: It is not possible to do a both correct and easy environmental assessment.

If all KEPIs are gathered and if the user is assisted by an expert, the tool allows receiving an adequate estimation of the environmental burden of the considered food product.

If used with expert support, this tool can contribute to an increased understanding of SMEs on their environmental burden and help them focus on the important steps in food production. It can facilitate data collection over the production chain and the collaboration between suppliers and processing enterprises. The environmental identification document delivered by the tool can be used by the SME for information on its environmental impacts.

References

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