LIFE CYCLE ASSESSMENT OF FOOD

Accept challenges

The food industry is one of the biggest contributors to global environmental impacts. Especially land use, animal husbandry, agrochemicals, and wastefulness with food frequently come under public scrutiny. Mitigation of environmental impacts could include reducing production-related emissions, developing more energy-efficient production methods, and encouraging consumer behavioral changes. Such improvements require both optimization of production and consumption on various levels. Only if manufacturers, policymakers, and consumers work together, will it be possible to identify and implement target-oriented strategies for a more sustainable food industry. For producers this is not only the chance for a more efficient usage of resources, on which their production depends, but also to optimize process chains.

Define the approach

Life cycle assessment, as standardized in ISO 14040/14044, can be used to achieve the above objectives. Products or services are studied over the entire life cycles along the value chain and represented in an environmental profile. Life cycle inventory data, as well as impact assessment results can help the LCA practitioner to make better informed decisions regarding sustainability. If required, this quantitative information can be complemented by qualitative ratings.

Given commonly decentralized value chains, however, the complex relationship between input and output as well as variable influencing factors on farm production demand a special approach. A life cycle assessment with these challenges can only be properly conducted with specially developed models for the agricultural sector and with appropriate software solutions.
Modelling and software solutions

Agricultural modelling
In cooperation with PE INTERNATIONAL AG, a highly sophisticated, fully parameterized and non-linear agricultural model has been developed, fitted to the complex relations in agro-processing, within the software and dataset system GaBi. The model contains datasets for upstream agriculture and animal husbandry as well as for downstream processing of products. The entire value chain is represented, beginning with seed preparation, arable farming, fertilization and other soil amendments, harvesting, processing, transportation logistics, and storage.

Assessment of land use
Traditional impact assessment categories capture a large part of the global environmental impact of a product’s life cycle. The effects on local conditions, however, are more difficult to model. These local considerations include ecosystem services, such as groundwater recharge, filtration capacity of the soil and biodiversity. In 2002, the department of Life Cycle Engineering developed a fully functional tool in collaboration with research and industry partners. This tool is called LANCA® (Land Use Indicator Value Calculation Tool) and allows the user to assess soil-based ecosystem services, including erosion resistance, mechanical and physicochemical filtration, groundwater recharge, and biotic production.

Benefits for product design
Life cycle assessment in the agricultural and food industry allows industry leaders and policy makers to make more informed decisions as they incorporate early assessment and critical information into their consideration of production alternatives. Regular updates for GaBi and LANCA® ensure the most accurate and current environmental and economic data. This ensures an efficient and tailor-made project realization, because the work focuses on the actual core of the problem. Furthermore, product benchmarking provides an assessment of how the product in question measures against others on the market. Overall, LCA in the agricultural and food industries can help measure environmental impacts of a product throughout its life-cycle so that hotspots can be identified, processes improved, costs cut, and marketing strategies oriented for optimal success.

OUR SERVICES
- Extensive know-how and high technical expertise in agricultural modelling
- Comparison of production alternatives
- Environmental Product Declarations (EPD) of food and agricultural products
- Environmental Profile and Carbon Footprint of food and agricultural products
- Land use assessments
- Biodiversity assessments
- Water Footprint methods