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IML

FRAUNHOFER INSTITUTE FOR MATERIAL FLOW AND LOGISTICS IML

ECOLOGICAL AND ECONOMIC ASSESSMENT

ENVIRONMENT AND ECONOMY HAND IN HAND

The 21st century leads mankind to its natural borders. With growing world population the availability of natural resources like crude oil, natural gas, ore or drinking water diminishes. Besides, this decreasing availability meets a worldwide rising demand. These commodities as a consequence, become progressively scarce and more expensive. At the same time, it is necessary to reduce the emissions of greenhouse gases decisively, above all CO_2 emission, to prevent further climate changes.
The need for a more efficient use of resources as a key task is strongly becoming a centre of focus for economy, society, research and politics. Against this background, energy efficient and resource efficient management increasingly becomes a decisive success factor, since: The careful and efficient use of resources involves significant saving potentials. Depending on case of application, this potential can be shown and tapped with the methods of Cleaner Production, Carbon Footprint Analysis and Life Cycle Assessment.

Methodological competence

Cleaner Production stands for production integrated environment protection and it is a method to specifically make production processes more efficient and resource-saving by optimising waste amounts, sewage and consumption of energy and resources.

The Carbon Footprint Analysis provides information on CO_2 emissions of a study area, such as product lifecycle, a company's distribution structure or services of a logistics service provider. Apart from the greenhouse effect, the Life Cycle Assessment covers further environmental impact categories such as pollution due to particles (PM10) and consumption of fossil fuels. Both methods point out the environmental compatibility of e.g. products or services. The results clarify the extent of ecological optimization potential of product parts and sub-processes.

The Fraunhofer IML links these studies closely to profitability analysis, so that in the end, eco-efficient measures can be derived.

Our procedure

Fraunhofer IML bases its ecological assessments on existing and preliminary **norms and standards** (e. g. VDI guideline 4075, ISO 14040ff, ISO 14064f). Depending on the respective project objective, the project team discusses and decides on the application of those.

At the beginning of every project the **consideration level** is defined first. Thereby, Fraunhofer IML distinguishes between the ecological assessment on the **level of enterprise, system and product**: Should the focus be on the company as a whole with e.g. various sites and activities, or is a specific product with all its components (e. g. including packaging and labels) to be assessed?

Afterwards the **balance scopes** with the relevant processes are recorded and visualized together with the employees of your company. By means of a **macroanalysis** based on a preliminary material and quantity structure, the environmental impacts of processes are estimated (e.g. CO_2 emissions, energy and resource consumption). The resulting information enables to identify the relevant study objects for the subsequent microanalysis.

The **microanalysis** may only cover processes within your company or even processes of suppliers, retailers or other partners of the supply chain. In the following step, company specific data is allocated to these processes such as quantity structures, resources and energy consumption, distances, applied production techniques and vehicles.

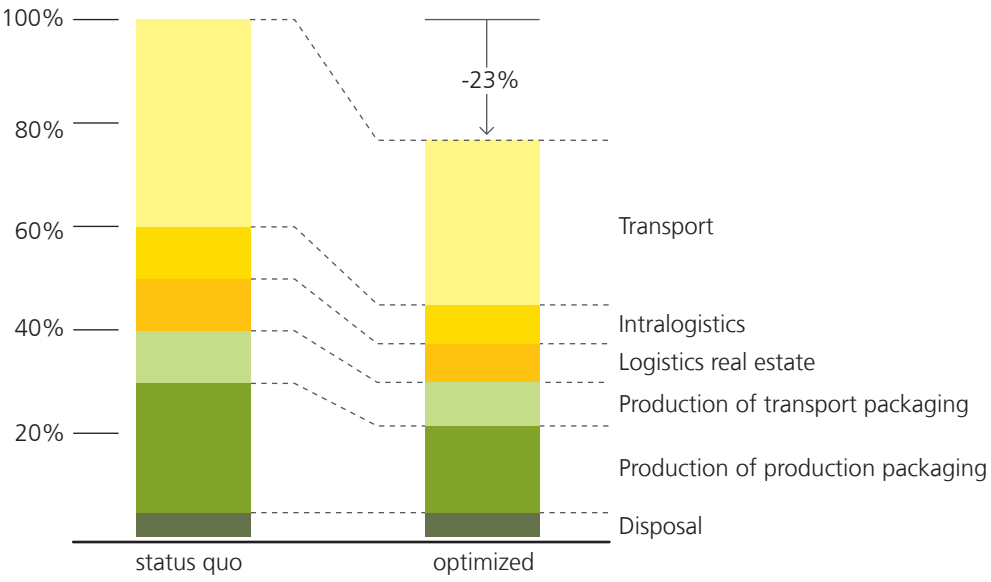
Within the **assessment phase**, this process structure is then, modeled, if necessary by means of specific software. Process by process the environmental impact is calculated and visualized. In the next step this offers the identification of the main emission drivers and other weak points of the process chain.

For the identified weak points possible solutions may be elaborated in the **optimization phase** and various scenarios are developed. These scenarios are analyzed and assessed by means of profitability studies – e.g. cost/benefit analyses. In the end, optimization measures are derived and recommendations for action are provided.

The Fraunhofer IML offers support in the implementation and **realization of the developed measures**. This includes the assistance in tendering procedures as well as extended project management with monitoring of dates and tasks as required. Further, success control of the implemented measures is performed.

Your benefit

- Environmental impact of various products, logistic systems and services is appraisable and comparable
- Process analysis offers an improvement of corporate processes
- Optimized use of resources and reduction of company costs
- Environmental impacts are quantified for own products, services and sub-processes
- Eco-efficient company strategies are developed and implemented to accomplish Corporate Social Responsibility (CSR)



CO_2 saving potential: The methods of Fraunhofer IML allow the assessment of complex logistic chains across companies.

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