Deliverable D4.1

Scientific Case Study Concepts

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Executive Summary

The Scientific Case Study Concepts customized for each of case study SMEs, including setting of individual improvement targets was prepared. Each case study concept covers description of the assessment scenario, what will be assessed and for what purpose, which specific methodological questions will be addressed by the case studies as well as ILCD datasets tentatively generated in the case studies. This deliverable clarifies also, under which criteria the case studies will be evaluated later on.

The case study for **bio-based plastics** sector will be applied to a biodegradable and compostable shopping bag obtained from renewable-based raw materials. The case study will serve as a demonstration of the methodology concept for bio-based plastics already developed in WP2. Specifically data acquisition, interpretation of results and functionality of the tool for SMEs will be the most important criteria to be analyzed. The main outcome will be to use this data as a basis for the development of ILCD datasets for the bio-based plastics sector.

In the sector **industrial machines** simplified LCAs for precision grinding, laser processing and electro-discharge machining will be carried out, with the aim to validate the methodological approach of the developed tool and identify any necessary amendments. The ILCD datasets also will be extracted from the results of the LCAs.

The aim of the case study on **electronics** sector will be to demonstrate how a basic environmental assessment tool can be developed, that allows designers and manufactures to establish best options both for design of specific equipment, for evaluating lifetime and service strategies, and for communication of related assessment results.

In **sensor** sector the case study investigates three different applications in a metal sheet production plant, which represent a variety of expected application benefits. The exemplary assessment has to verify whether the LCA to go approach is capable of providing suitable decision support for these applications. The case study will identify the main indicators which are directly linked to the efficiency of the production plant.

In the TTA case study on **photovoltaic systems** the different options of PV systems will be analyzed depending on the access to the grid, and the regulatory framework and tariff schemes in the different countries. The environmental benefits of a PV installation project will be assessed, weighting the impacts of producing, installing and maintaining the system components against the savings realized due to replaced electricity from the conventional grid mix.

The simplified LCA of different types of PCBs will be carried out in the case studies on **Printed Circuit Boards**. Based on the case study results the recommendation for the PCB tool algorithms improvement will be established.

In the Future-shape case study on **smart textiles** a dedicated product redesign will be analysed. Special attention will be given to reducing the power consumption and replacing the textile polyester material. LCA evaluation will secure the success of the redesign in terms of environmental product performance. The whole process serves as a test bed for the new LCA to go tool, which will be tested against the previously applied LCA approach.

It is worthwhile noticing, that a significant number of ILCD compliant datasets can be derived from the case studies, but in many cases these datasets are not necessarily needed in an ILCD compliant format for the purpose of the LCA to go assessment, nor do the assessment with the LCA to go sectoral tools directly lead to ILCD compliant datasets. Compiling ILCD compliant datasets therefore is an add-on activity, following the requirements of the Description of Work.