

Modelling techniques for future-oriented LCA and forecasting scenarios

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Life cycle assessment (LCA) and footprint analysis (e.g. carbon footprint, water footprint and environmental footprint) have been increasingly used by both institutions and private companies in the past years. In current practice, many studies conducted are used for decision making regarding long term investment and equipment or to predict how the environmental impacts of production and consumption systems will change in the future as a result of the changing environment and lifestyle. However, most LCAs are still based on past or current emission measurement, this approach being usually retained because of the inherent uncertainties that occur when time is taken into account, for instance at the level of data inventory, impact characterisation, scenario definition or consequences on other systems. The uncertainties grow with the time horizon, as many technical, political, economic and societal choices to come are not yet known. Predictions are difficult in the mid-term. In the long-term perspective they are typically futile. An attempt to include the consequences of decisions in LCA is provided by consequential LCA, which has been used to describe complex systems with future scenarios. Besides attributional and consequential LCA, many other modelling techniques have been developed in the literature, using bottom-up (i.e. decisional LCA, Product Environmental Footprint) as well as top-down approaches (i.e. hybrid approach). However, there is still a lot of discussion around these different modes. Are there overlaps among them and in what decision-context situations are they better suited? What is the role of scenario analysis with regard to the different modelling techniques? Besides the market information taken into account in consequential LCA, what kind of other information and mechanisms can be addressed by the different models? The aim of this session is to elaborate on the challenges connected with LCA and future scenarios, both at product and system level, and discuss possible solutions and modelling techniques to overcome these challenges. We invite presentations on approaches dealing with the uncertainty and freedom of choice inherent in the future, functional unit definition, the inclusion of dynamics in LCIs advanced scenario design, and the analyses of strong and weak aspects of existing approaches, their main hurdles and how to proper frame their use in different. Presentations covering LCA linked with modelling techniques such as partial equilibrium models, macro-LCA, general equilibrium models, agent-based models, etc. are also encouraged.

Keywords: life cycle assessment, modelling, uncertainties, scenarios

SESSION TYPE: Platform, Poster Spotlight, Poster and Poster Corner

ADVISORY GROUP: Life-Cycle Assessment Advisory Group (Europe)