New Developments in Life Cycle Impact Assessment

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Innovative computational systems and analytical methods allow for developing new and improving existing life cycle impact assessment methods. Geographic Information Systems, remote sensing tools and novel digitized data sources support an enhanced spatially and temporally resolved modeling of environmental impacts such as eutrophication, land use, water use, noise impacts and biodiversity damages. Advanced analytical methods enable a better evaluation of emerging contaminants such as endocrine disrupters and nanoparticles. This session gave a platform for impact characterization frameworks and models showing latest developments in typical and new impact categories. Regarding biodiversity damages, LCA case studies assessing damage on aquatic or terrestrial biodiversity using existing LCIA methods, and results supporting the improvement of the framework of biodiversity modelling in LCIA are welcome. Special aspects such as linking these new LCIA methods to inventory schemes, representing uncertainty and communicating LCIA results to stakeholders will be additionally discussed.

Session Highlights

Several presentations were made on how to include land use impacts on biodiversity and ecosystem services. Most of these have been developed under the United Nations Environmental Program/SETAC Life Cycle Initiative framework and included methods with global coverage, for example, on carbon cycling between terrestrial ecosystems and the atmosphere.

Another significant part of this session was dedicated to water use in LCA. Here, presentations included a systematic review of existing methods, as well as indicators for deriving operational characterization methods and factors. A standardization process has been initiated, but further harmonization is required.

Further LCIA developments presented included occupational indoor, abiotic depletion and thermal pollution.

There were also discussions on the trade-offs between detailed analysis and practicability. Some approaches are very detailed and advanced, and can address several open issues in the LCA field, for example including region-dependency in impact assessment. Alternative approaches may be less detailed – many based on end point assessments – and, hence, have a relatively high uncertainty.

The relevance and applicability of these new developments in LCIA warrants considerable efforts in the future, particularly in the strengthening of the link between LCI and LCIA.

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