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Presentations	Session 4.2	<i>Global Forest Bioeconomy: Continuity or a Pathway to Transformations? (Part 2)</i>

Abstract Session 4.2 – A Framework for Implementing Holistic and Integrated Life Cycle Sustainability Assessment of Bioeconomy Regions.

Currently the social, environmental and economic risks and challenges of the bioeconomy are becoming increasingly the subject of applied sustainability assessments. Based on the life cycle assessment (LCA) methodology, further approaches of integrated assessment modeling were developed whereby life cycle sustainability assessment (LCSA) aims to combine the evaluation of social, environmental and economic effects. In the current early stage of LCSA development, this study seeks to identify a practical framework for LCSA implementation.

We selected indicators from existing suitable LCA and LCSA approaches as well as from the FAO Indicators to Monitor the Bioeconomy on product and territorial level and allocated them to a sustainability concept for holistic and integrated life cycle sustainability assessment (HILCSA) based on the SDGs. For a practical implementation of HILCSA we chose the software environment of openLCA in regard to its current state and future potential for LCSA application in context of regional holistic and integrated BE sustainability assessments.

On the one hand, this study presents an overview of existing indicators and LCIA as well as their link to the SDGs of general interest in sustainability assessment. This shows the possibility of LCSA to cover nearly all SDGs in terms of planetary boundaries, a sustainable provisioning system and human needs. On the other hand, we provide a framework for HILCSA of regional bioeconomy which includes several main results: an ideal indicator set containing all indicators for regional (product & territorial) bioeconomy assessment, a practical indicator set which is applicable with the currently given means, and a composition of LCIA methods suitable for their impact assessment.