

11<sup>th</sup> CONFERENCE ON  
SUSTAINABLE DEVELOPMENT  
OF ENERGY, WATER AND  
ENVIRONMENT SYSTEMS

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**BOOK OF  
ABSTRACTS**

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INTERNATIONAL CENTRE FOR SUSTAINABLE DEVELOPMENT  
OF ENERGY, WATER AND ENVIRONMENT SYSTEMS

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## **BOOK OF ABSTRACTS**

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RS57-1: Sustainability comparisons and measurements methodologies 1

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**SDEWES2016.0043 Integrating Social Aspect into Sustainability  
Assessment of Bio-Based Industries: Towards a  
Systemic Approach**

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**Abstract**

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Biobased industries require to be assessed on their positive and negative impacts on sustainable development. However, social factors are usually neglected in the majority of impact assessments of biobased industries: they are mainly focused on environmental performance and (techno)-economic assessments. This review proposes a new systemic approach for assessing and integrating the social dimension into sustainability assessments of biobased industries. First the main methodologies for assessing social impacts in biobased industries are compared. Social Life Cycle Analysis (SLCA) is considered to have promising methodological attributes for biobased industries' social sustainability assessment, although it is still in its early steps of development. Second, a new systemic framework was developed following the four main iterative steps of an SLCA framework and based on three useful SLCA-based approaches including Product Social Impact Assessment; Prosuite and the UNEP SETAC Guidelines for SLCA of Products. The proposed framework allows incorporating the social impacts into a techno-economic assessments (TEA) model through providing both a final social score and separate scores for each indicator category and life cycle phase. The result of this study particularly highlights the importance of considering social issues in biobased industries' design and innovation. Using the proposed systemic approach, industry and policy makers gain a better insight into the full sustainability performance (i.e. including social aspects) of biobased industries.