Supplementary Information

Table S1. Nomenclature table

Abbreviation	Name
ACEA	European Automotive Manufacturer Association
AoP	Areas of Protection
B2S	Business to Society
BMW	Bayrische Motoren Werke AG
CO_2e	carbon dioxide equivalent
CS	Corporate Sustainability
CSR	Corporate Social Responsibility
DALY	Disability-Adjusted Life Years
E-LCA	Environmental Life Cycle Assessment
E-LCI	Environmental Life Cycle Inventory
FU	Functional Unit
GaBi	Ganzheitliche Bilanzierung
IE	Industrial Ecology
ISO	International Standardization Organization
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
LCSA	Life Cycle Sustainability Assessments
LCT	Life Cycle Thinking
LCWE	Life Cycle Working Environment
MCDA	Multi-Criteria Decision Analysis
MDG	Millennium Development Goals
NGO	Non-governmental Organization
PDCA	Plan-Do-Check-Act
PEF	Product Environmental Footprint
PRP	Performance Reference Points
PSI	Product Sustainability Index
PSIA	Handbook for Product Social Impact Assessments
PSILCA	Database for Product Social Impact Life Cycle Assessments
QDA	Qualitative Data Analysis
SAM	Subcategory Assessment Method
SDG	Sustainable Development Goals
SELCA	Social and Environmental Life Cycle Assessment
S-OLCA	Social Organizational Life Cycle Assessment
SET	Social Exchange Theory
SETAC	Society of Environmental Toxicology and Chemistry
SHDB	Social Hotspot Database

S-LCA	Social Life Cycle Assessment
S-LCIA	Social Life Cycle Impact Assessment
ToC	Theory of Change
UNEP	United Nations Environment Programme

Table S2. List of analyzed publications from 2015-2020

Ref.	Authors	Year	Approach	Title
[1]	Baumann et al.	2013	Empirical	Does the Production of an Airbag Injure more People than the Airbag Saves in Traffic?
[2]	Chhipi-Shrestha et al.	2015	Theoretical	'Socializing' sustainability: a critical review on current development status of social life cycle impact assessment method
[3]	Martínez-Blanco et al.	2015	Analytical	Social organizational LCA (SOLCA)—a new approach for implementing social LCA
[4]	Ren et al.	2015	Analytical + empirical	Prioritization of bioethanol production pathways in China based on life cycle sustainability assessment and multicriteria decision-making
[5]	Umair et al.	2015	Empirical	Social impact assessment of informal recycling of electronic ICT waste in Pakistan using UNEP SETAC guidelines
[6]	Karklina et al.	2015	Empirical	Social life cycle assessment of biomethane production and distribution in Latvia
[7]	Luca et al.	2015	Analytical + empirical	Social Life Cycle Assessment and Participatory Approaches: A Methodological Proposal Applied to Citrus Farming in Southern Italy
[8]	Dong and Ng	2015	Analytical + empirical	A social life cycle assessment model for building construction in Hong Kong
[9]	Mattioda et al.	2015	Theoretical	Determining the principal references of the social life cycle assessment of products
[10]	Di Cesare et al.	2015	Theoretical	Positive impacts and Indicator Categories in Social Life Cycle Assessment. Results from a systematic review
[11]	Dewulf et al.	2015	Analytical	Toward an Overall Analytical Framework for the Integrated Sustainability Assessment of the Production and Supply of Raw Materials and Primary Energy Carriers
[12]	Bocoum et al.	2015	Analytical + empirical	Anticipating impacts on health based on changes in income inequality caused by life cycles

[13]	Kim et al.	2015	Analytical + empirical	Evaluating the perceived social impacts of hosting large-scale sport tourism events: Scale development and validation
[14]	Musaazi et al.	2015	Empirical	Quantification of social equity in life cycle assessment for increased sustainable production of sanitary products in Uganda
[15]	Dunmade et al.	2016	Empirical	A Social Lifecycle Assessment Model for Sachet Water Production in Nigeria
[16]	Barros Telles do Carmo et al.	2016	Analytical + empirical	Social impacts profile of suppliers: a S-LCA approach
[17]	Thorstensen and Forsberg	2016	Theoretical	Social Life Cycle Assessment as a resource for Responsible Research and Innovation
[18]	Wang et al.	2016	Analytical	An analytic framework for social life cycle impact assessment—part 1: methodology
[19]	Karlewski	2016	Analytical + empirical	Social Life Cycle Assessment in der Automobilindustrie
[20]	Jasiński et al.	2016	Analytical	A comprehensive framework for automotive sustainability assessment
[21]	Van Haaster et al.	2017	Analytical + empirical	Development of a methodological framework for social life cycle assessment of novel technologies
[22]	Suckling and Lee	2017	Empirical	Integrating Environmental and Social Life Cycle Assessment
[23]	Lenzo et al.	2017	Analytical + empirical	Social Life Cycle Assessment in the Textile Sector: An Italian Case Study
[24]	Wulf et al.	2017	Analytical + empirical	Lessons Learned from a Life Cycle Sustainability Assessment of Rare Earth Permanent Magnets
[25]	Mattioda et al.	2017	Empirical	Social Life Cycle Assessment of Hydrogen Energy Technologies
[26]	Schlör et al.	2017	Empirical	The social footprint of hydrogen production - A Social Life Cycle Assessment (S-LCA) of alkaline water electrolysis
[27]	Mirdar Harijani et al.	2017	Analytical + empirical	A multi-objective model for sustainable recycling of municipal solid waste
[28]	Yi Teah and Onuki	2017	Empirical	Support Phosphorus Recycling Policy with Social Life Cycle Assessment: A Case of Japan
[29]	Corona et al.	2017	Analytical + empirical	Social Life Cycle Assessment of a Concentrated Solar Power Plant in Spain
[30]	Kühnen and Hahn	2017	Theoretical	Indicators in Social Life Cycle Assessment A Review of Frameworks, Theories, and Empirical Experience

[16]	Barros Telles do Carmo et al.	2017	Analytical + empirical	Customized scoring and weighting approaches for quantifying and aggregating results in social life cycle impact assessment
[31]	Wang et al.	2017	Empirical	An analytical framework for social life cycle impact assessment—part 2: case study of labor impacts in an IC packaging company
[32]	Tarne et al.	2017	Theoretical	Review of Life Cycle Sustainability Assessment and Potential for Its Adoption at an Automotive Company
[33]	Chen and Holden	2017	Empirical	Social life cycle assessment of average Irish dairy farm
[34]	Cardoso et al.	2017	Empirical	Economic, environmental, and social impacts of different sugarcane production systems
[35]	Zimmer et al.	2017	Analytical + empirical	Assessing social risks of global supply chains: A quantitative analytical approach and its application to supplier selection in the German automotive industry
[36]	Siebert et al.	2018a	Analytical	Social life cycle assessment indices and indicators to monitor the social implications of wood-based products
[37]	Sureau et al.	2018	Theoretical	Social life cycle assessment frameworks: a review of criteria and indicators proposed to assess social and socioeconomic impacts
[38]	Zanchi et al.	2018	Analytical	Analysis of the main elements affecting social LCA applications: challenges for the automotive sector
[39]	Souza et al.	2018	Analytical + empirical	Social life cycle assessment of first and second-generation ethanol production technologies in Brazil
[40]	Sousa-Zomer and Miguel	2018	Empirical	The main challenges for social life cycle assessment (SLCA) to support the social impacts analysis of product-service systems
[41]	Opher et al.	2018	Analytical + empirical	A comparative social life cycle assessment of urban domestic water reuse alternatives
[42]	Mancini and Sala	2018	Theoretical	Social impact assessment in the mining sector: Review and comparison of indicators frameworks
[43]	Siebert et al.	2018c	Analytical + empirical	Social life cycle assessment: in pursuit of a framework for assessing wood-based products from bioeconomy regions in Germany

[44]	Singh and Gupta	2018	Empirical	Social life cycle assessment in Indian steel sector: a case study
[45]	Hossain et al.	2018	Analytical + empirical	Development of social sustainability assessment method and a comparative case study on assessing recycled construction materials
[46]	Hobson and Lynch	2018	Theoretical	Ecological modernization, techno-politics and social life cycle assessment: a view from human geography
[47]	Arvidsson et al.	2018	Empirical	A method for human health impact assessment in social LCA: lessons from three case studies
[48]	Hannouf and Assefa	2018	Analytical + empirical	Subcategory assessment method for social life cycle assessment: a case study of high-density polyethylene production in Alberta, Canada
[49]	Macombe et al.	2018	Theoretical	Preface: Social LCA in progress
[50]	Lobsiger-Kägi et al.	2018	Analytical + empirical	Social Life Cycle Assessment: Specific Approach and Case Study for Switzerland
[51]	Petti et al.	2018	Theoretical	Systematic literature review in social life cycle assessment
[52]	Shang et al.	2018	Analytical + empirical	Ontology based social life cycle assessment for product development
[53]	Acrese et al.	2018	Theoretical	State of the art in S-LCA: integrating literature review and automatic text analysis
[54]	Ekener et al.	2018	Analytical + empirical	Addressing positive impacts in social LCA—discussing current and new approaches exemplified by the case of vehicle fuels
[55]	Hauschild et al.	2018	Theoretical	Social Life Cycle Assessment: An Introduction. In: Hauschild et al. 2018 Life Cycle Assessment Theory and Practice
[56]	Lucchetti et al.	2018	Theoretical	S-LCA applications: a case studies analysis
[57]	Zimdars et al.	2018	Analytical + empirical	Enhancing comprehensive measurement of social impacts in S-LCA by including environmental and economic aspects
[58]	Aleisa and Al-Jarallah	2018	Empirical	A triple bottom line evaluation of solid waste management strategies: a case study for an arid Gulf State, Kuwait
[59]	Subramanian and yung	2018	Theoretical	Modeling Social Life Cycle Assessment framework for an electronic screen product e A case study of an integrated desktop computer

[60]	McCabe and Halog	2018	Theoretical	Exploring the potential of participatory systems thinking techniques in progressing SLCA
[61]	Valente et al.	2018	Empirical	Testing environmental and social indicators for biorefineries: bioethanol and biochemical production
[62]	Siebert et al.	2018b	Analytical + empirical	How not to compare apples and oranges: Generate context-specific performance reference points for a social life cycle assessment model
[63]	Shemfe et al.	2018	Empirical	Social Hotspot Analysis and Trade Policy Implications of the Use of Bioelectrochemical Systems for Resource Recovery from Wastewater
[64]	Russo Garrido et al.	2018	Theoretical	A literature review of type I SLCA—making the logic underlying methodological choices explicit
[65]	Di Cesare et al.	2018	Theoretical	Positive impacts in social life cycle assessment: state of the art and the way forward
[66]	Dunmade et al.	2018	Empirical	Lifecycle Impact Assessment of an Engineering Project Management Process – a SLCA Approach
[67]	Grubert	2018	Theoretical	Rigor in social life cycle assessment: improving the scientific grounding of SLCA
[68]	Fan et al.	2018	Analytical + empirical	Evaluation for social and humanity demand on green residential districts in China based on SLCA
[69]	Falcone and Imbert	2018	Theoretical	Social Life Cycle Approach as a Tool for Promoting the Market Uptake of Bio-Based Products from a Consumer Perspective
[70]	Iofrida et al.	2018a	Theoretical	Can social research paradigms justify the diversity of approaches to social life cycle assessment?
[71]	Iofrida et al.	2018b	Theoretical	Why social life cycle assessment is struggling in development?
[72]	Dubois-Iorgulescu et al.	2018	Theoretical	How to define the system in social life cycle assessments? A critical review of the state of the art and identification of needed developments
[73]	Cooper et al.	2018	Empirical	Sustainability of UK shale gas in comparison with other electricity options: Current situation and future scenarios
[74]	Kühnen and Hahn	2018	Theoretical	From SLCA to Positive Sustainability Performance Measurement - A Two-Tier Delphi Study

[75]	Soltanpour et al.	2019	Theoretical	Area of protection in S-LCA: human well-being or societal quality
[76]	Venkatesh	2019	Theoretical	Critique of selected peer-reviewed publications on applied social life cycle assessment: focus on cases from developing countries
[77]	Shi et al.	2019	Analytical + empirical	A social sustainability assessment model for manufacturing company based on S-LCA
[78]	Pillain et al.	2019	Analytical + empirical	Social life cycle assessment framework for evaluation of potential job creation with an application in the French carbon fiber aeronautical recycling sector
[79]	Prasara et al.	2019	Analytical + empirical	Environmental and social life cycle assessment to enhance sustainability of sugarcane-based products in Thailand
[80]	Croes and Vermuelen	2019	Analytical	Quantification of corruption in preventative cost-based S-LCA: a contribution to the Oiconomy project
[81]	D'Eusanio et al.	2019	Analytical + empirical	Social Life cycle Assessment of a Piece of Jewellery. Emphasis on the Local Community
[82]	Dunmade	2019	Analytical + empirical	Potential social lifecycle impact analysis of bioenergy from household and market wastes in African cities
[83]	Di Noi et al.	2019	Analytical + empirical	Can S-LCA methodology support responsible sourcing of raw materials in EU policy context?
[84]	Baig et al.	2019	Empirical	Impact assessment of sanitation system on the socio-economic aspects of local community and environment in Hunza Valley Gilgit Baltistan-Pakistan
[85]	Wah et al.	2019	Empirical	Social impact evaluation of tea production using Social Life Cycle Assessments (S-LCA) method in Cameron Highlands. Pahang, Malaysia
[86]	Iofrida et al.	2019	Analytical + empirical	Psychosocial risk factors' impact pathway for social life cycle assessment: an application to citrus life cycles in South Italy
[87]	Sureau et al.	2019	Analytical + empirical	Participation in S-LCA: A Methodological Proposal Applied to Belgian Alternative Food Chains (Part 1)
[88]	Muhammad et al.	2019	Empirical	Social implications of palm oil production through social life cycle perspectives in Johor, Malaysia

[89]	Wulf et al.	2019	Theoretical	Review of Sustainability Assessment Approaches Based on Life Cycles
[90]	Falcone et al.	2019	Theoretical	Transitioning towards the bio-economy: Assessing the social dimension through a stakeholder lens
[91]	Du et al.	2019	Empirical	Enriching the results of screening social life cycle assessment using content analysis: a case study of sugarcane in Brazil
[92]	Karlewski et al.	2019	Empirical	A Practical Approach for Social Life Cycle Assessment in the Automotive Industry
[93]	Zheng et al.	2020	Empirical	Modeling life-cycle social assessment in sustainable pavement management at project level
[94]	Stamford	2020	Empirical	Life cycle sustainability assessment in the energy sector
[95]	Tokede and Traverso	2020	Theoretical	Implementing the guidelines for social life cycle assessment: past, present, and future
[96]	Rafiaani et al.	2020a	Analytical	Identifying Social Indicators for Sustainability Assessment of CCU Technologies: A Modified Multi-criteria Decision Making
[97]	Rafiaani et al.	2020b	Empirical	A critical view on social performance assessment at company level: social life cycle analysis of an algae case
[98]	Osorio-Tejada et al.	2020	Empirical	An integrated social life cycle assessment of freight transport systems
[99]	Penadés-Plà et al.	2020	Analytical + empirical	Environmental and Social Impact Assessment of Optimized Post-Tensioned Concrete Road Bridges
[100]	Matthioda et al.	2020	Theoretical	Social life cycle assessment of biofuel production
[101]	Herrera Almanza and Corona	2020	Analytical + empirical	Using Social Life Cycle Assessment to analyze the contribution of products to the Sustainable Development Goals: a case study in the textile sector
[102]	Gompf et al.	2020	Theoretical	Towards social life cycle assessment of mobility services: systematic literature review and the way forward
[103]	Flor-Montalvo et al.	2020	Empirical	Social-LCA. Methodological Proposal Applied to Physical Activity Program Implementation into Old People's Routines

[104]	Azimi et al.	2020	Empirical	Social Life cycle Assessment of Household Waste Management System in Kabul City
[105]	Ramos Huarachi et al.	2020	Theoretical	Past and future of Social Life Cycle Assessment: Historical evolution and research trends
[106]	Endres et al.	2020	Theoretical	Sozioökonomische Nachhaltigkeitsbewertung in: Endres et al. 2020 Biokunststoffe unter dem Blickwinkel der Nachhaltigkeit und Kommunikation Status quo, Möglichkeiten und Herausforderungen
[107]	Sureau et al.	2020	Theoretical	Different paths in social life cycle impact assessment (S-LCIA)—a classification of type II impact pathway approaches
[108]	Jarosch et al.	2020	Analytical + empirical	A Regional Socio-Economic Life Cycle Assessment of a Bioeconomy Value Chain
[109]	Arvidsson Segerkvist et al.	2020	Theoretical	Research on Environmental, Economic, and Social Sustainability in Dairy Farming: A Systematic Mapping of Current Literature
[110]	Naghshineh et al.	2020	Analytical + empirical	A Social Life Cycle Assessment Framework for Additive Manufacturing Products
[111]	Barke et al.	2020	Analytical	Socio-economic life cycle assessment of future aircraft systems

Table S3. List of S-LCA studies related to the automotive industry (2013-2020)

Ref	Authors	Year	Approach	Title
[1]	Baumann et al.	2013	Empirical	Does the Production of an Airbag Injure more People than the Airbag Saves in Traffic?
[19]	Karlewski	2016	Analytical + Empirical	Social Life Cycle Assessment in der Automobilindustrie
[20]	Jasiński et al.	2016	Analytical	A comprehensive framework for automotive sustainability assessment
[32]	Tarne et al.	2017	Theoretical	Review of Life Cycle Sustainability Assessment and Potential for Its Adoption at an Automotive Company
[35]	Zimmer et al.	2017	Analytical + Empirical	Assessing social risks of global supply chains: A quantitative analytical approach and its application to supplier selection in the German automotive industry
[38]	Zanchi et al.	2018	Analytical	Analysis of the main elements affecting social LCA applications: challenges for the automotive sector
[54]	Ekener et al.	2018	Analytical + Empirical	Addressing positive impacts in social LCA—discussing current and new approaches exemplified by the case of vehicle fuels

[77]	Shi et al.	2019	Analytical Empirical	A social sustainability assessment model for manufacturing company based on S-LCA
[92]	Karlewski et al.	2019	Empirical	A Practical Approach for Social Life Cycle Assessment in the Automotive Industry
[102]	Gompf et al.	2020	Theoretical	Towards social life cycle assessment of mobility services: systematic literature review and the way forward

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