The 10TH International Conference on

Life Cycle Management

PROGRAM 01 – 08 SEPTEMBER 2021
STUTTGART, GERMANY
Welcome to LCM 2021  4
Host of LCM – Organizers 2021  6
Scientific and Business Committee  8
Themes of LCM 2021  12

Monday, 06 September / Scientific program  14
Tuesday, 07 September / Scientific program  34
Wednesday, 08 September / Scientific program  52

LCM Book  72
Moderators  73
Keynote Speakers  74
Pre-Conference Week  80
Poster-Pitches  84
Sponsors  90
About Stuttgart  94

Thank you  98
Contact  99
Welcome to LCM 2021

For the 10th anniversary event of the LCM Life Cycle Management conference series, we are the first time in a virtual conference environment and “Building a Sustainable Future Based on Innovation and Digitalization” is our motto, our claim and our vision. With the people and for the people we strive for building a sustainable future. We want to take up the megatrend of digitalization and make it usable for LCM, thus triggering innovations and shaping a sustainable future.

The LCM Life Cycle Management conference series is one of the world’s leading forums for environmental, economic and social sustainability. The focus is on practical solutions for the implementation of life cycle approaches into strategic and operational decision-making, whether in science, industry, NGOs or public institutions. In 2021 the LCM conference is organized in Stuttgart, Germany, by the scientific chair Fraunhofer IBP as part of the Fraunhofer-Gesellschaft, the world’s leading applied research organization, supported by academic co-chair IABP at University of Stuttgart, one of the leading technically oriented Universities in Germany, the industrial co-chair German Sustainable Building Council DGNB, Europe’s largest network for sustainable building, as well as the industrial co-chair Festo SE & Co. KG, a family-owned company and worldwide leader in automation and a world market leader in technical training and development. With a research institution, a university, a large business network and a worldwide operating company as industry partner, we have in 2021 four hosts covering LCM topics from basic research to applied research and transfer of solutions into the economy to industrial and political implementation. Networking, training, development of solutions and transfer of solutions into application are the daily business of the hosts and represent the core and multiplicity of Life Cycle Management.

With its start in 2001 in Copenhagen it is a continuous development process and in the meanwhile a good tradition for all supporters and designers of sustainability solutions to meet every two years in another city and share new insights. The LCM conference series starting in Copenhagen (2001) via Barcelona (2005), Zurich (2007), Cape Town (2009), Berlin (2011), Gothenburg (2013), Bordeaux (2015), Luxembourg (2017) to Poznań (2019) is this year hosted in Stuttgart, Germany.

The strong industrial region of Stuttgart, known for its hidden champions, small and medium enterprises, global acting corporations and leading research institutions and universities, is presenting this digital LCM. Stuttgart region is an innovative and worldwide leading industrial location, but also known for its versatile cultural institutions and museums. People from more than 170 nations live together in Stuttgart and enjoy their everyday life.

For LCM 2021 we welcome not only well-known and experienced LCM participants but also new ones from all regions of the world. With the increasing awareness for sustainability in politics, business and society, LCM invites decision-makers and implementers, researchers and developers, networkers and multipliers to participate and benefit from each other’s experiences.

The objective of LCM 2021 is to online discuss and advance the implementation of Life Cycle approaches with a broad scope of industry sectors, supply chain stages, company sizes, sustainability focuses, research activities and stakeholders. Challenges and solutions are shared and fruitful collaboration is strengthened through online networking opportunities. Sustainable innovations from research and industry are presented to support high quality solutions along the full life cycle on product, system and corporate level.
LCM 2021 stands for covering the entire Life Cycle from raw material extraction through production and use phase to end-of-life options, addressing all dimensions of sustainability including environment, social and economy, implementing circular economy and tackling the climate challenge.

LCM 2021 this year is the online platform to meet your friends, partners and customers in the area of sustainability. It gives the opportunity to gain new friends, partners and customers and maintain and develop the LCM network as a global sustainability network. It is also the platform to develop ideas, new projects and future success. You can present your solutions and success stories, discuss opportunities, profit from the rich LCM network and create added value.

As the first virtual event in the long LCM conference series, we had to break new ground without losing the heart of this conference series – and we think that an attractive package with known and also new formats and possibilities has been created. All participants are invited to take advantage of the various offerings to benefit from LCM 2021.

On behalf of the organizing team, we warmly welcome all participants and wish you a fruitful, insightful and successful conference.

The LCM 2021 conference is hosted by the Fraunhofer Institute for Building Physics IBP, Department Life Cycle Engineering GaBi. The Institute for Acoustics and Building Physics IABP at University of Stuttgart supports the conference organization as academic co-chair and the German Sustainable Building Council DGNB plus Festo SE & Co. KG as industrial co-chairs.
**GERMAN SUSTAINABLE BUILDING COUNCIL (DGNB E.V.)**

The DGNB German Sustainable Building Council was founded in 2007 and has around 1400 members, making it Europe’s biggest network for sustainable building. The aim of the DGNB is to promote sustainability in the construction and real estate industry and instil awareness of building sustainability among the broader population. The DGNB is an independent non-profit organisation. Its certification system offers a planning and optimisation tool for evaluating sustainable buildings interiors and districts. It was developed to help organisations enhance the tangible sustainability of construction projects. The DGNB system is based on the concept of holistic sustainability, placing equal emphasis on the environment, people and commercial viability. Lifecycle assessment of buildings is key in building sustainably. The DGNB Academy is an education and training platform that has already provided more than 5500 people from more than 45 countries with official qualifications in sustainable building.

---

**FRAUNHOFER INSTITUTE FOR BUILDING PHYSICS IBP**

The Fraunhofer Institute for Building Physics IBP was founded in 1929 and is among the most experienced and established institutes of the Fraunhofer-Gesellschaft, the world’s leading applied research organization. The primary focus of Fraunhofer IBP’s work is on research & development, testing, demonstration and consulting in the various specialist areas of building physics and sustainability. At the Department Life Cycle Engineering GaBi we analyze products, processes and services under ecological, economic, societal and technical aspects. The analysis extends over the entire life journey – from the extraction of raw materials, to production and usage, up to end of life. This is based on the life-cycle-related analysis of process chains and of material and energy flows.

Depending on the objective, analyses of individual aspects are also possible and appropriate. As well as giving assistance in making individual decisions, Life Cycle Engineering can also serve to optimize a system or facilitate specific innovations. The particular benefit of Life Cycle Engineering arises from the consistent analysis of a system from several perspectives; this can yield fresh insights and help prevent one-sided decisions. Life Cycle Engineering thus helps reduce risks and identify opportunities. Applied Methods for our scientifically founded activity cover Life Cycle Engineering, Life Cycle Assessment, Life Cycle Costing, social aspects, Sustainability Assessment, Design for Environment, Environmental Product Declarations, Material and Substance Flow Analysis, LANCA® land-use methodology and GENERIS® software system.
UNIVERSITY OF STUTTGART
The Institute for Acoustics and Building Physics IABP at University of Stuttgart is dedicated to the current challenges of the sustainable design of our built environment. With a competent team and an interdisciplinary network with national and international cooperation partners, scientific questions are answered and new solutions and methods are developed. The complex knowledge and the scientific findings go directly into the well-founded, committed and innovative teaching.

The research field of Life Cycle Engineering includes ecological, socio-economic as well as technical analysis and optimization from process to product. The sustainability studies connect the built and the natural environment with each other: From the provision of energy, the production of materials, the recovery and recycling of high-quality material flows to the mobility, construction and living of today, tomorrow and the day after tomorrow. Research work covers a wide range of topics such as novel mobility concepts, renewable energy sources and energy storage, bio-based materials, functionally integrated materials and components, circular economy, resource efficiency and lightweight construction, land use and biodiversity. New technologies, ever more complex processes and value-added chains and constant social and global change are creating new framework conditions that require further scientific thinking and rethinking.

FESTO
Festo is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. Festo has set standards in industrial automation technology and technical education ever since its establishment, thereby making a contribution to sustainable development of the environment, the economy and society. The company supplies pneumatic and electrical automation technology to 300,000 customers of factory and process automation in over 35 industries. The LifeTech sector with medical technology and laboratory automation is becoming increasingly important. The products and services are available in 176 countries. With about 20,000 employees in over 250 branch offices in 61 countries worldwide, Festo achieved a turnover of around € 2.84 billion in 2020. Each year around 8 % of this turnover is invested in research and development. In this learning company, 1.5 % of turnover is invested in basic and further training. Festo Didactic SE is a leading provider of technical education and training and offers its customers worldwide comprehensive digital and physical learning solutions in the industrial environment.
Successful Life Cycle Management is a collaborative effort across disciplines and sectorial borders, just like the organization of an LCM conference. We would like to express our gratitude to our Scientific and Business Committee, with active representation from universities, governmental organizations, institutes, non-governmental organizations and businesses alike. Their commitment and expert knowledge have been invaluable in the set-up and execution of this conference.

**CHAIR**
Stefan Albrecht, Fraunhofer IBP

**CO-CHAIRS**
- Mercedes Barkmeyer, Festo SE & Co. KG
- Matthias Fischer, Fraunhofer IBP
- Anna Braune, DGNB e.V., German Sustainable Building Council

**Scientific and Business Committee**
MEMBERS
Naeem Adibi, WeLOOP
Carina Alles, Swiss Federal Office of Energy
Martin Baitz, Sphera Solutions GmbH
Sanjeevan Bajaj, Forum for Sustainability through Life Cycle Innovation e.V.
Peter Bartel, Circular Economy Solutions GmbH
Rupert J. Baumgartner, University of Graz
Beatrix Becker, Evonik Operations GmbH
Enrico Benetto, Luxembourg Institute of Science and Technology
Johanna Berlin, RISE Reserach Institutes of Sweden AB
Anna Björklund, Royal Institute of Technology KTH
Ulrike Bos, Sphera Solutions GmbH
Anne-Marie Boulay, CIRAIG / Université de Montréal
Urte Brand, DLR Institute of Networked Energy Systems
Ann-Kathrin Briem, University of Stuttgart
Birgit Brunklau, RISE Reserach Institutes of Sweden AB
Sonia Karin Chapman, Rede Empresarial Brasileira de Avaliação de Ciclo de Vida (Rede ACV)
Mauro Cordella, TECNALIA
Jo Dewulf, Ghent University
Christian Donath, ECO Platform AISBL
Jim Fava, Anthesis Group
Matthias Finkbeiner, TU Berlin
Alexander Forell, Makersite GmbH
Magnus Fröhling, TU Munich (TUM)

Hans J. Garvens, Umweltbundesamt (German Environment Agency) / Hochschule für Technik und Wirtschaft HTW Berlin
Jens Glöggler, ATP sustain GmbH
Annette Hafner, Ruhr University Bochum
Michael Hiete, Ulm University
Georg Hoffmann, Alfred Ritter GmbH & Co. KG
Andrea Hohmann, Fraunhofer IGCV
Florian Holl, Verso GmbH
Alexander Hollberg, Chalmers University of Technology
Maike Horlacher, Sphera Solutions GmbH
Torsten Hummen, Robert Bosch GmbH
Diego Iribarren, IMDEA Energy
Andreas Jenne, REHAU Group
Daniel Kellenberger, Intep
Eva Knüpffer, Fraunhofer IBP
Nicolas Koch, Mercator Research Institute on Global Commons and Climate Change GmbH
Iris Kral, denkstatt GmbH
Florian Krautzner, denkstatt GmbH
Johannes Kreißig, DGNB e.V. – German Sustainable Building Council
Stephan Krinke, Volkswagen AG
Christian Krüger, BASF SE
Oliver Kusche, ok\worx
Claus Lang-Koetz, Pforzheim University
Kévin Le Blevennec, VITO
Scientific and Business Committee

MEMBERS
Jan Paul Lindner, Bochum University of Applied Sciences
Andreas Maslo, Verso GmbH
Alexander Maak, INTERSEROH Dienstleistungs GmbH / ALBA Services
Paolo Masoni, Ecoinnovazione srl
Ann-Charlotte Mellquist, RISE Reserach Institutes of Sweden AB
Eric Mieras, PRé Sustainability
Stéphane Morel, Quantis
Barbara Nebel, Thinkstep ANZ
Hanna Nilsson-Lindén, RISE Reserach Institutes of Sweden AB
Philippe Osset, Solinnen
Nikolaj Otte, Henkel AG & Co. KGaA
Sara Palander, Swedish Life Cycle Center
Elisabetta Palumbo, RWTH Aachen University
Alexandra Pehlken, OFFIS – Institute for Information Technology
Lina Psarra, Rockfon, part of ROCKWOOL Group
Bernd Reinsch, Robert Bosch GmbH
Emma Rex, RISE Reserach Institutes of Sweden AB
Dusan Ristic, German Institute of Food Technologies (DIL e.V.)
Alexander Röder, Institut Bauen und Umwelt e.V.
Michael Rumberg, University of Applied Forest Sciences Rottenburg
Silvia Rummel, Festo SE & Co. KG
Tomas Rydberg, IVL Swedish Environmental Research Institute
Maria Rydberg, Swedish Life Cycle Center
Peter Saling, BASF SE
Carla Scagnetti, University of Stuttgart
Erwin M. Schau, InnoRenew CoE
Christine Schneider, Henkel AG & Co. KGaA
Georg Schöner, Carlsberg Breweries A/S
Diederik Schowanek, Procter & Gamble
Guido Sonnemann, Université de Bordeaux
Matthias Stucki, Zurich University of Applied Sciences
Marzia Traverso, RWTH Aachen University
Ian Vazquez-Rowe, Pontificia Universidad Católica del Perú
Tobias Viere, Pforzheim University
Alain Wathelet, Solvay SA
Laurie Wright, Solent University
Susana Xara, European Commission – Health and Digital Executive Agency (HaDEA)
Themes of LCM 2021

The 10th International Conference on Life Cycle Management presents you an impressive online program with thematically inspiring parallel sessions, great keynote speeches and workshops. In the spirit of the previous conferences, LCM 2021 will also focus on topics that address the implementation of life cycle concepts along the value chains of companies. In this way, the conference is intended to be a platform for the LCM community to take innovative paths towards a more sustainable society and to establish solutions for new methods and approaches in life cycle management. In 2020, a call for proposals for session topics was published – as a result, more than 90 session proposals were received. In order to give the necessary space to the thematically different approaches from science and industry, the final conference programme was designed around various core topics that are currently on the agenda of both companies and science as well as politics: These include the implementation and evaluation of the circular economy, the role of the SDGs and the implementation of digitalisation in Industry 4.0.

**LIFE CYCLE AND CIRCULAR ECONOMY**
- Circular Economy Buildings – from Research to Practice
- Tools, Metrics and Labels for a Circular Economy
- Life Cycle Approaches in the Raw Materials Sector
- Addressing Marine Litter Within Life Cycle Assessment and Management
- Carbon Inventory and Management of Bio-Based Materials for a Post-Fossil Bioeconomy
- SDG as a Basis for Sustainability Assessments of Products and Companies
- Operationalising Life Cycle Sustainability Assessment

**URBAN LIVING AND MOBILITY**
- Transformation Towards Future Mobility
- Decarbonized Mobility Along the Value Chain
- Future Sustainable Lifestyles – Individual Choices
- Future Sustainable Lifestyles – Urban Structure
- Benefits of Retaining Materials and Their Quality in a Circular Economy
- Circularity and Life Cycle Aspects of Recycling Technologies

**SUSTAINABILITY AND IMPACT ASSESSMENT**
- Life Cycle Sustainability in Construction and Renovation of Buildings
- Achieving Sustainability Goals on the Regional, National and International Level
- Land Use and Biodiversity in Life Cycle Management
- Prospective Life Cycle Sustainability Assessment of Energy Technologies
- Benefits of Retaining Materials and Their Quality in a Circular Economy
- Circularity and Life Cycle Aspects of Recycling Technologies
APPLICATION AND TRANSFER TO BUSINESS
– Life Cycle Innovation to Drive Sustainability and Business Performance
– Sustainability of Business Models and Innovations
– Transfer Towards Climate Neutrality – Scenarios, Options and Valuation
– Business Models for a Circular Economy
– Business Life Cycle Networks
– Life Cycle Thinking in Companies and Organizations
– Sustainability Assessments in Industry Creating Meaningful Information
– Sustainable Chemicals and Materials

LIFE CYCLE IMPACTS, METRICS AND DATA IN INNOVATION
– Life Cycle Metrics in Sustainable Finance and Business
– Social Life Cycle Assessment of Products
– What Gets Measured, Gets Improved – Impact Assessment and Environmental Labeling Along the Production Chain

DIGITALIZATION IN CIRCULAR ECONOMY
– Digital Technologies for a Circular Economy
– Circular Economy and Circular Society in LCM

DIGITAL SOLUTIONS FOR LIFE CYCLE MANAGEMENT
– Green-Lean-Digital
– Mainstreaming Construction LCA – Based on an Open Data Network
– Mobilizing LCA Resources Through Digital Collaboration
– Applied Digital Solutions – Connecting Green and Digital Transformations?
– Building Information Modeling (BIM) and Life Cycle Assessment
– Life Cycle Data Supporting Supply Chain Management

LCM AND DIGITALIZATION
– Life Cycle Management in Education and Culture
– The Role of Industry in Sustainable Supply Chains
– SDG Corporate Responsibility
Schedule

MONDAY, 06 SEPTEMBER
08:30 – 18:15 CEST

KEYNOTE SPEECH
09:00 – 9:45 CEST

HOST-SESSION FROM FRAUNHOFER IBP
11:30 – 12:15 CEST

LUNCH BREAK
12:15 – 13:15 CEST
Building a Sustainable Future Based on Innovation and Digitalization

Moderators: Rebecca Freitag and Dr. Hannes Krieg

08:30 – 09:00 CEST  Beginning of the conference day  ||  Getting in the mood for the day

09:00 – 09:45 CEST  Keynote Speech by Eric Mieras, Managing Director at PRé Sustainability.
Is it the perfect wave for LCA?

09:45 – 11:15 CEST  Parallel-Session Slot 1  ||  MO.1.A – MO.1.E

11:15 – 11:30 CEST  Coffee Break

11:30 – 12:15 CEST  Host-Session from Fraunhofer IBP
Rethinking LCA for Product Stewardship and Corporate Sustainability

Efficient, scalable and flexible LCA capacity has become a major success factor for today’s businesses. Based on the experience from various applied research projects, the session will provide practical insights into operationalizing sustainability data science in industry.

Speakers  ||  Presenters:
Dr.-Ing. Daniel Wehner, Head of Data-Science powered Product Stewardship at Department Life Cycle Engineering
Dr.-Ing. Robert Ilg, Head of Business Development at Department Life Cycle Engineering
Ann-Kathrin Briem, Sun Hea Hong, Tobias Prenzel, Experts in the field of Data-Science powered Product Stewardship, Department Life Cycle Engineering

12:15 – 13:15 CEST  Lunch Break
Schedule

MONDAY, 06 SEPTEMBER
08:30 – 18:15 CEST

BASF NETWORKING-SESSION
12:15 – 13:15 CEST

KEYNOTE SPEECH
13:30 – 14:15 CEST

GaBi LIFETIME AWARD
16:00 – 16:30 CEST
12:15 – 13:15 CEST  **BASF Networking-Session**  
Sustainability assessments, LCA – methodology, strategy and practice

We at BASF want to create value for the environment, society and business with our products, solutions and technologies. To do so, we are increasing the relevance of sustainability in our steering processes, business models and customer interaction. This establishes us as a key partner supporting our customers, opens up new growth areas and secures the long-term success of our company. To advance our sustainable business strategy, we leverage digital technologies and data management systems to create value for us and our customers. To effectively manage sustainability and to support our strategy, we measure our sustainability performance in each of the three pillars of sustainability on different levels and with different scopes. Moreover, we also actively share our sustainability methodologies both in academia and the market. Get in contact in this network session with experts and executives of BASF to discuss challenges and opportunities to improve the sustainability of business and societies on our planet.

**Speakers || Presenters:**
- **Dr. Christoph Jäkel**, Head of Corporate Sustainability at BASF
- **Alessandro Pistillo**, Director Digital Strategic Projects at BASF
- **Birgit Hellmann**, Global Sustainability Communications at BASF
- **Klara Truong**, Global Sustainability Communications at BASF
- **Prof. Dr. Peter Saling**, Director Sustainability Methods at BASF
- **Andreas Kleinke**, Head of Sustainability Strategy at BASF
- **Andreas Horn**, Carbon Steering at BASF
- **Max Silva**, Applied Sustainability at BASF Fundação Espaço ECO
- **Rafael Selvaggio Vinas**, Applied Sustainability at BASF Fundação Espaço ECO
- **Michelle Scachetti**, Applied Sustainability at BASF Fundação Espaço ECO

13:15 – 13:30 CEST  **Refresh after Lunch**

13:30 – 14:15 CEST  **Keynote Speech by Dr. Janin Schaffer**, Physical Oceanographer at the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research  
The MOSAiC expedition. A year-long drift across the Central Arctic to study climate processes


15:45 – 16:00 CEST  **Coffee Break**

16:00 – 16:30 CEST  **GaBi Lifetime Award**  
Honoring the life work of Prof. Dr. Peter Eyerer

16:30 – 18:00 CEST  **Parallel-Session Slot 3 || MO.3.A – MO.3.E**

18:00 – 18:15 CEST  **Take Home-Message || End of the conference day**
Schedule

MONDAY, 06 SEPTEMBER
09:45 – 18:00 CEST

SESSION SLOT 1 || MO.1.A – MO.1.E
09:45 – 11:15 CEST

SESSION SLOT 2 || MO.2.A – MO.2.E
14:15 – 15:45 CEST

16:30 – 18:00 CEST
LIFE CYCLE APPROACHES IN THE RAW MATERIALS SECTOR

Sessions Chairs:  
Xara, Susana  || European Commission – Health and Digital Executive Agency (HaDEA)  
Pehlken, Alexandra  || OFFIS – Institute for Information Technology

A short deep dive into calculating the ADP characterisation factors – understanding, challenging and improving the current approach  
Reuter, Benjamin

Limitations and recommendations of LCA databases of mining activities for some raw materials  
Fiorletta, Mathilde; Lai, Frédéric; Bonnemaison, Michel; Garcia, Jade; Osset, Philippe  1SCORE LCA

What we really know about critical raw material impact?  
Penaherrera, Fernando; Pehlken, Alexandra; Koch, Bjoern  1OFFIS e. V. – Institute for Information Technology

ISO-adjusted allocation of mineral commodities in ecoinvent  
Sonderegger, Thomas; Bourgault, Guillaume; Moreno Ruiz, Emilia; Wernet, Gregor  1ecoinvent

Identification of dissipative emissions for improved assessment of metal resource use in LCA  
Owsianiak, Mikolaj; Hauschild, Michael  1Technical University of Denmark
TRANSFORMATION TOWARDS FUTURE MOBILITY

Sessions Chairs:  Forell, Alexander  || Makersite GmbH
                Björklund, Anna  || Royal Institute of Technology KTH

Aviation energy transformation in Sweden – a case study of environmental assessment of the future transition pathways in socio-technical systems
Lai, Celeste Yat-Yin¹; Björklund, Anna; Karakaya, Emrah  ¹KTH – Royal Institute of Technology

New Life Cycle Inventories from Clean Sky Airframe technologies
Salles, Ana¹; Lätsch, Corinna; Das, Totaram; Prado, Luis; Coskun, Selim; ¹Fraunhofer ICT
Pfeuffer, Simon; Geß, Andreas

Future Mobility in the year 2040
Lozanovski, Aleksandar¹; Geß, Andreas; Held, Michael ¹University of Stuttgart

Integrating design for environment to achieve carbon neutral mobility
Forell, Alexander¹; Danzer, Christoph ¹Makersite GmbH
MO.1.C

ACHIEVING SUSTAINABILITY GOALS ON THE REGIONAL, NATIONAL AND INTERNATIONAL LEVEL

Sessions Chairs: Kellenberger, Daniel || Intep
Rydberg, Tomas || IVL Swedish Environmental Research Institute

Integrating Life Cycle Assessment into the electric model Stella: A case for Germany.
Benitez, Alicia1; Wulf, Christina; Geldermann, Jutta || Forschungzentrum Jülich GmbH

Decarbonizing regions to meet the Paris Agreement 2 °C target: The Luxembourg Greater Region as a case study
Gibon, Thomas; Hitaj, Claudia1; Igos, Elorri; Babi Almenar, Javier || Luxembourg Institute of Science and Technology (LIST)

Structured Integration of Social Sustainability in Strategic Network Design: The Case of Bioethanol Production in the EU
Messmann, Lukas1; Wietschel, Lars1; Thorenz, Andrea; Tuma, Axel || University of Augsburg

Regional sustainability through life cycle management
Rydberg, Tomas1; Adibi, Naeem; Balkau, Fritz; Bezama, Alberto; Massari, Stefania; _________ || IVL Swedish Environmental Research Institute
Modak, Prasad; Sonnemann, Guido; Strothmann, Philip; Wiche, Pia

The vision of the «2000-Watt Society» and its instruments
Kellenberger, Daniel1; Lucio, Susanna || Intep – Integrale Planung GmbH

Life cycle methodologies for regional sustainable development
Dvarioniene, Jolanta1; Balkau, Fritz; Hurtado, Sandra Elia; Lembo, Francesco || Kaunas University of Technology
LAND USE AND BIODIVERSITY IN LIFE CYCLE MANAGEMENT

Sessions Chairs:  
Lindner, Jan Paul  II  Bochum University of Applied Sciences  
Bos, Ulrike  II  Sphera Solutions GmbH

Development of an impact assessment method for desertification in LCA
Liu, Runya¹; Ohashi, Haruka; Matsui, Tetsuya; Hirata, Akiko; Itsubo, Norihiro  
¹Tokyo City University

Biodiversity impact assessment of land using processes in the supply chain of passenger cars
Quandt, Julian¹; Lindner, Jan Paul; Schüler, Maximilian  
¹Hochschule Bochum, Fraunhofer Institut für Angewandte Informationstechnik

Flow property-based assessment of land use impacts on biodiversity using GIS in Life Cycle Assessments
Maier, Stephanie¹; Horn, Rafael¹; Bos, Ulrike; Uusitalo, Ville  
¹University of Stuttgart – IABP

Life Cycle biodiversity impact assessment of beef production in the United States
Rottmann, Désirée¹; Jüde, Franziska¹; Lindner, Jan Paul; Zimmermann, John;  
¹Bochum University of Applied Sciences
Johnson, Joardan; Thoma, Greg

Development of crop specific ecoregion factors for countries for biodiversity impact assessment
Mumm, Nico¹; Eberle, Ulrike  
¹corsus – corporate sustainability GmbH
WHAT GETS MEASURED, GETS IMPROVED – IMPACT ASSESSMENT AND ENVIRONMENTAL LABELING ALONG THE PRODUCTION CHAIN

Sessions Chairs: Schöner, Georg II Carlsberg Breweries A/S
Ristic, Dusan II German Institute of Food Technologies (DIL e.V.)

WBCSD Value Chain Carbon Transparency Pathfinder: Creating an ecosystem for Scope 3 emissions transparency
Stanley, Anna; Safaei, Amir1

Solving the Trilemma – Climate-Friendly, Healthy, and Popular Meals for Retirement Homes and Canteens
Bradford, Sebastian1; Stucki, Matthias; Berger, Verena

Voluntary Sustainability Standards and Blockchain Technology – Interactions and Outcomes
Köhler, Susanne; Bager, Simon; Pizzol, Massimo1

M-Check: Using existing data for the implementation of a product sustainability rating
Alig, Martina1; Kunz, Jenny

Learnings of national application of Environmental Footprint in Companies and Organizations
Palander, Sara; Spak, Björn1; Sanne, Karin; Lorentzon, Katarina; Rydberg, Maria; Wikström, Anna

1World Business Council for Sustainable Development (WBCSD)
1Zurich University of Applied Sciences (ZHAW)
1Aalborg University
1Intep GmbH
1Swedish Environmental Protection Agency
LIFE CYCLE APPROACHES IN THE RAW MATERIALS SECTOR II

Sessions Chairs:  
Xara, Susana  European Commission – Health and Digital Executive Agency (HaDEA)  
Pehlken, Alexandra  OFFIS – Institute for Information Technology

Analyzing feasibility of a new nickel slag valorization sector with prospective life cycle assessment  
Quéheille, Eva1; Dauvergne, Michel; Ventura, Anne 1Gustave Eiffel University

The paradox of the circular economy in the raw materials industry  
Regueiro, Manuel1; Alonso Jimenez, Antonio 1Geological Survey of Spain

How to generate more reliable data for the LCA of the raw material sector: the importance of interdisciplinarity  
Muller, Stephanie1; Beylot, Antoine; Lai, Frédéric; Villeneuve, Jacques; 1BRGM  
Moore, Kathryn; Sanchidrián, José A.; Kinnunen, Päivi

Mitigation Potential of Greenhouse Gas Emissions from Circular Economy Strategies on Quebec Steel Industry and its Value Chain  
Binet, Flavien1; Margni, Manuele; Saunier, François 1CIRAIG, Polytechnique Montréal

Stochastic approach based on the Monte Carlo (MC) simulation used for Life Cycle Inventory (LCI) uncertainty analysis in the Rare Earth Elements (REEs) recovery  
SALA, Dariusz1; Bieda, Boguslaw1 1AGH University of Science and Technology
DECARBONIZED MOBILITY ALONG THE VALUE CHAIN

Sessions Chairs:  Krinke, Stephan II Volkswagen AG  
                 Koch, Nicolas II Mercator Research Institute on Global Commons and Climate Change gGmbH

Life Cycle Assessment of Power-to-Liquid for Aviation:  
A Case Study of a Passenger Aircraft  
Papantoni, Veatriki1; Linke, Florian; Dahlmann, Katrin; Kühlen, Markus; Silberhorn, Daniel; Brand, Urte; Vogt, Thomas

Environmental performance of mass balanced polycarbonate  
Schenk, Karolin1; Bechtle, Miriam; Himmelreich, Birgit

Environmental evaluation of future generations of batteries, implementation of eco-design in a R&D context  
Rodríguez Buitrón1; Betsabé Elizabeth1; Cor, Emmanuelle; Monnier, Elise; Perdu, Fabien; Reynier, Yvan; Martinet, Sébastien

LCAs of different powertrains as basis for decarbonisation  
Schüler, Maximilian; Gernuks, Marko; Plaga, Benjamin; Hentschel, Jan1

SALCOS® – Salzgitter Low CO2 Steelmaking, the pathway to carbon neutral steel for value chains  
Traupe, Jens1; Gintaut, Thorsten
MO.2.C

14:15 – 15:45 CEST

TRANSFER TOWARDS CLIMATE NEUTRALITY – SCENARIOS, OPTIONS AND VALUATION

Sessions Chairs: Garvens, Hans J. II Umweltbundesamt (German Environment Agency)
Baitz, Martin II Sphera Solutions GmbH

Sustainable transition of the primary steel production
Suer, Julian1; Traverso, Marzia; Ahrenhold, Frank 1RWTH Aachen & thyssenkrupp Steel Europe AG

Transfer towards climate neutrality – from LCA to a business case
Garvens, Hans J.1 Umweltbundesamt (German Environment Agency) and Hochschule für Technik und Wirtschaft HTW Berlin

Life cycle based assessment of decarbonisation options – towards scientifically robust carbon neutrality
Bach, Vanessa1; Finkbeiner, Matthias 1Technische Universität Berlin

The need for more “dynamics” in Life Cycle Assessments for improved building-related decision making processes
Kreißig, Johannes1; Fischer, Matthias; Braune, Anna 1German Sustainable Building Council – DGNB e.V.

Future air mobility scenarios and its environmental impact
Behtke, Maurice1; Rödger, Jan-Markus; Gauß, Philipp; Zierleyn, Fabian 1umlaut consulting GmbH
CARBON INVENTORY AND MANAGEMENT OF BIO-BASED MATERIALS FOR A POST-FOSSIL BIOECONOMY

Sessions Chairs: Rumberg, Michael  || University of Applied Forest Sciences Rottenburg  
Stucki, Matthias  || Zurich University of Applied Sciences

Storing or utilizing biological CO₂ from a Norwegian paper mill, or no capture at all. Which is the best solution?
Modahl, Ingunn Saur; Raadal, Hanne Lerche¹  NORSUS

Life cycle assessment and dynamic material flow analysis of biochar applications in urban environments: case study in Uppsala, Sweden
Azzi, Elias¹; Karlton, Erik; Sundberg, Cecilia  KTH, Royal Institute of Technology

Environmental and economic assessment of using wood to meet Paris Agreement greenhouse gas emission reductions in Slovenia
Schau, Erwin M.¹; Tavzes, Črtomir; Gavri, Igor; Šušteršič, Iztok;  InnoRenew CoE
Preslovec Niemelä, Eva; Dávid, Balázs; Pečnik, Jaka; DeVallance, David

Prospective life cycle assessment of innovative hardwood products
Sander-Titgemeyer, Anna¹; Weber-Blaschke, Gabriele  Holzforschung, Technische Universität München

Making ends meet: review of applied LCA methodology in the bio-based industrial sectors and recommendations
Løkke, Søren¹  AAU
WHAT GETS MEASURED, GETS IMPROVED – IMPACT ASSESSMENT AND ENVIRONMENTAL LABELING ALONG THE PRODUCTION CHAIN II

Sessions Chairs:  
Schöner, Georg  || Carlsberg Breweries A/S  
Ristic, Dusan  || German Institute of Food Technologies (DIL e.V.)

Evaluating the compliance of existing building Life cycle assessment (LCA) benchmarks in Europe with respect to the Paris climate agreement goals  
Iyer, Vignesh¹; Ebert, Samuel; Wagner, Anna; Hollberg, Alexander ¹Technische Universität München

Towards Embodied Carbon Benchmarks for the European Building Industry  
Röck, Martin¹; Hvid Horup Sørensen, Lise; Lynge, Kirsten; Tozan, Buket; Shcack, Rikke; ______ ¹KU Leuven  
Fields, Maya; Collin, Christine; Le Den, Xavier; Birgisdóttir, Harpa

Assessing Environmental Impacts of Construction Products: The Role of Embedded and Operational Impacts in the Environmental Performance of Wooden Windows  
Del Rosario, Pamela¹; Palumbo, Elisabetta; Traverso, Marzia ¹RWTH Aachen University – Institut für Nachhaltigkeit im Bauwesen

Development of new LCA based benchmarks for certification of buildings  
Braune, Anna; Quante, Kathrin¹ ¹DGNB e.V. – German Sustainable Building Council

Verification of environmental product declarations – how strict should it be?  
Johnsen, Fredrik Moltu¹; Tellnes, Lars G. F. ¹Norwegian Institute for Sustainability Research (NORSUS)
Traceability of chemicals along the supply chains as enabler for more sustainable leather
Schenten, Julian; Kaluziak, Eleni

Supplier-specific Life Cycle Inventory database for chemicals and plastics
Kätelhön, Arne; Meys, Raoul; Stellner, Laura; Bardow, André; Suh, Sangwon

A “Sustainable-by-Design” approach in research and technology organizations
Igos, Elorri; Zinck, Sébastien; Gibon, Thomas; Schaubroeck, Thomas; Benetto, Enrico

A global circular economy for plastics: Technical potential for greenhouse gas mitigation
Meys, Raoul; Kätelhön, Arne; Bachmann, Marvin; Winter, Benedikt; Zibunas, Christian

Supporting early-design decisions with LCA: comparison of several architectures of electrochromic displays for anticounterfeiting application
Glogic, Edis; Futsch, Romain; Rougier, Aline; Sonnemann, Guido
PROSPECTIVE LIFE CYCLE SUSTAINABILITY ASSESSMENT OF ENERGY TECHNOLOGIES

Sessions Chairs: Brand, Urte | DLR Institute of Networked Energy Systems
Iribarren, Diego | IMDEA Energy

Environmental consequences of future bioenergy deployment pathways
Gibbon, Thomas1; Baustert, Paul; Navarrete Gutiérrez, Tomás; Morales, Marjorie; Hahn Menacho, Álvaro José; Arvesen, Anders
1Luxembourg Institute of Science and Technology (LIST)

Energy storage with less metal scarcity? Prospective life cycle assessment of lithium-sulfur batteries with a focus on mineral resources
Wickerts, Sanna1; Arvidsson, Rickard; Chordia, Mudit; Nordelöf, Anders; Svanström, Magdalena; Johansson, Patrik
1Chalmers University of Technology

Prospective life cycle assessment of hydrogen produced through solid oxide electrolysis
Puig-Samper, Gonzalo; Iribarren, Diego1; Dufour, Javier
1Fundación IMDEA Energía

Prospective LCA and LCC applied on different Power-to-Gas technologies
Koj, Jan Christian1; Harzendorf, Freia; Zapp, Petra
1Forschungszentrum Jülich

Sustainability and Future Trajectories: How is Prospectivity Integrated into Life Cycle Sustainability Assessment of Energy Technologies in Practice?
Brand, Urte1; Gomez Trillos, Juan Camilo; Lütkehaus, Hauke; Papantoni, Veatriki; Tippe, Mareike; Pade, Christian; Oswald, Matthias; Vogt, Thomas
1DLR – Institute of Networked Energy Systems
CIRCULARITY AND LIFE CYCLE ASPECTS OF RECYCLING TECHNOLOGIES

Sessions Chairs: Horlacher, Maike II Sphera Solutions GmbH
Krüger, Christian II BASF SE

Enabling a circular economy for plastics: Life Cycle Assessment for Eastman’s commercial-scale advanced recycling solution – Methanolysis
Pierce, Jason1; Granados, Patricia2

Recirculation of battery raw materials – the effects of allocation within a Life Cycle Sustainability Assessment approach
Popien, Jan-Linus1; Thies, Christian; Spengler, Thomas S.

Recycling of plastics and LCA: Demonstrating the key technical aspects of the recycling chain, providing methodological guidance
Palluau, Magali; Hurgel, Charlotte; Osset, Philippe1; Garcia, Jade

Optimized life cycle for plastics, the role of chemical recycling
Smuk, Lena1; Berlin, Johanna1; Evangelopoulos, Panagiotis

Plastic recycling in a circular economy; determining environmental performance through an LCA matrix model approach.
Schwarz, Anna1; Ligthart, Tom; van Harmelen, Toon

1 Eastman
2 Quantis

1 Technische Universität Braunschweig

1 SCORE LCA

1 RISE Research Institutes of Sweden AB

1 TNO
ADDRESSING MARINE LITTER WITHIN LIFE CYCLE ASSESSMENT AND MANAGEMENT

**Sessions Chairs:** Boulay, Anne-Marie II CIRAIG / Université de Montréal  
Vazquez-Rowe, Ian II Pontificia Universidad Católica del Perú

**The plastics that got away: Country and sector specific losses to various environments.**  
Langeveld, Eline¹; Schwarz, Anna; van Harmelen, Toon ¹TNO

**Proposal for a new impact assessment pathway to assess marine debris in Life Cycle Assessment**  
Szablewski, Carolina¹; Lemaire, Honorine; Bâtis, Antoine; Yogarajah Croos, Amrutha; Torche, Maissae; Leclercq, Clémence; Bolle, Clément; Schrijvers, Dieuwertje; Adibi, Naeem ¹WeLOOP

**Bio-degradable plastics in a circular Economy**  
Mense, Marco¹ ¹Ecomatters

**Accounting for marine plastics in abiotic resource depletion**  
Vázquez-Rowe, Ian¹; Ita-Nagy, Diana; Kahhat, Ramzy ¹Pontificia Universidad Católica del Perú

**Plastic leakage of packaging in LCA – a theoretical framework**  
Scagnetti, Carla¹; Lorenz, Manuel ¹University of Stuttgart, Institute for Acoustics and Building Physics (IABP)
LIFE CYCLE METRICS IN SUSTAINABLE FINANCE AND BUSINESS

Sessions Chairs: Mellquist, Ann-Charlotte II RISE Reserach Institutes of Sweden AB
Benetto, Enrico II Luxembourg Institute of Science and Technology

Circular Economic assessment, barriers and opportunities
Andersen, Birgitte Holt1; Komkova, Anastasija 1C Ware ApS.

The reliability of input-output and lifecycle-based data for estimation of corporate carbon emissions: a comparative study of carbon footprints in the automotive sector
Popescu, Ioana-Stefania1; Chion, Laurent; Gibon, Thomas; Hitaj, Claudia; Benetto, Enrico 1Luxembourg Institute of Science and Technology (LIST)

Contributions of RenovaBio for Sustainable Finance: Evolution and perspectives
Scachetti, Michelle1; Machado Fernandes Costa, Paulo Roberto 1BASF – Fundação Espaço ECO

Use cases for life cycle assessment and life cycle costing in circular design
Hanski, Jyri; Uusitalo, Teuvo1; Barni, Andrea; Rääkkönen, Minna; Vatanen, Saija; 1VTT Technical Research Centre of Finland Ltd.
Fontana, Alessandro; Capuzzimati, Claudio

Rating, Credit Decision and Pricing – How Sustainability and Life Cycle Assessments are Changing Credit Practice
Ender, Manuela1; Ilg, Robert; Albrecht, Stefan; Fischer, Matthias; Wimmer, Konrad 1msg GillardonBSM AG
Schedule

TUESDAY, 07 SEPTEMBER
08:45 – 18:15 CEST

KEYNOTE SPEECH
09:00 – 9:45 CEST

PARALLEL-SESSION SLOT 1 || WORKSHOP BY SPHERA
09:45 – 11:15 CEST

HOST-SESSION FROM DGNB
11:30 – 12:15 CEST

KEYNOTE SPEECH
13:30 – 14:15 CEST
Building a Sustainable Future Based on Innovation and Digitalization

Moderators: Rebecca Freitag and Dr. Hannes Krieg

08:45 – 09:00 CEST  Beginning of the conference day || Getting in the mood for the day

09:00 – 09:45 CEST  Keynote Speech by Hannah Helmke, Co-founder and CEO of right. based on science
Effective decarbonisation: the significance of measuring climate impact in °C

09:45 – 11:15 CEST  Parallel-Session Slot 1 || TU.1.A – TU.1.E

Workshop by Sphera
Connecting the Dots – Simplifying Complexity Through Integrated Technologies

11:15 – 11:30 CEST  Coffee Break

11:30 – 12:15 CEST  Host-Session from DGNB
Carbon lifecycle management of buildings: How to design and build with a focus on embodied carbon?

The session shows, using the example of the wood hybrid project EDGE-Suedkreuz in Berlin, why and how embodied carbon plays an essential role to meet future requirements.

Speakers || Presenters:
Johannes Kreißig, Chief Executive Officer DGNB e.V. || DGNB GmbH
Thomas Kraubitz, Director Buro Happold

12:15 – 13:15 CEST  Lunch Break

13:15 – 13:30 CEST  Refresh after Lunch

13:30 – 14:15 CEST  Keynote Speech by Dr. Auma Obama, Founder and Executive Director of the Sauti Kuu Foundation
Valuing the sum total of all of us to guarantee a better and more sustainable future


15:45 – 16:00 CEST  Coffee Break

16:00 – 16:30 CEST  Inter-Action

16:30 – 18:00 CEST  Parallel-Session Slot 3 || TU.3.A – TU.3.E

18:00 – 18:15 CEST  Take Home-Message || End of the conference day
Schedule

TUESDAY, 07 SEPTEMBER
09:45 – 18:00 CEST

SESSION SLOT 1 || TU.1.A – TU.1.E
09:45 – 11:15 CEST

SESSION SLOT 2 || TU.2.A – TU.2.E
14:15 – 15:45 CEST

SESSION SLOT 3 || TU.3.A – TU.3.E
16:30 – 18:00 CEST
CIRCULAR ECONOMY BUILDINGS – FROM RESEARCH TO PRACTICE

Sessions Chairs:  
Hafner, Annette II Ruhr University Bochum  
Glöggler, Jens II ATP sustain GmbH

Illustrating Circularity of Building Components  
Hartmann, Max¹; Ebert, Samuel¹  
¹Technical University Munich

LCA supporting the design of circular biobased wall panels  
Delem, Laetitia¹; Douguet, Étienne; Wastiels, Lisa  
¹Belgian Building Research Institute (BBRI)

Promoting climate neutral urban areas – FutureBuilt zero method to measure compliance in pilot projects  
Resch, Eirik¹; Andreesen, Inger; Selvig, Eivind; Wiik, Marianne k.; Tellnes, Lars G. F.;  
¹Norwegian University of Science and Technology (NTNU)

Integrated Decision Support for Circular, Industrialised and Bio-based Construction Works  
Kayaçetin, Cihan¹; Verdoordt, Stijn; Leferve, Lode; Versele, Alexis  
¹KU Leuven – University of Leuven

Environmental and socio-economic benefits of circularity in real estate management  
Rydberg, Tomas¹; Andersson, Johanna; Gerhardsson, Hanna; Kultje, Eva;  
ºIVL Swedish Environmental Research Institute

1Technical University Munich
1Norwegian University of Science and Technology (NTNU)
1Belgian Building Research Institute (BBRI)
1KU Leuven – University of Leuven
1IVL Swedish Environmental Research Institute
FUTURE SUSTAINABLE LIFESTYLES – INDIVIDUAL CHOICES

Sessions Chairs: Brunklaus, Birgit II RISE Reserach Institutes of Sweden AB
Kreißig, Johannes II DGNB e.V. – German Sustainable Building Council

-Life-LCA: The first case study of the life cycle impacts of a human being
Bossek, David1; Görmer, Marcel; Bach, Vanessa; Finkbeiner, Matthias  

-Diets within planetary boundaries: What can be achieved through dietary change alone
Ridoutt, Bradley1; Baird, Danielle; Hendrie, Gilly  

-Increasing the sustainability of breakfast buffets with the use of digital waste-tracking tools
Goossens, Yanne1; Leverenz, Dominik; Kuntscher, Manuela  

-New ways for sustainable living & working – a potential study from Switzerland
Kakkos, Efstathios1; Vollrath, Fabian; Hischier, Roland  

-Environmental sustainability of the work from home lifestyle, opportunities and pitfalls
Beloin-Saint-Pierre, Didier1; Lasvaux, Sébastien  

1 Technische Universität Berlin – Institute of Environmental Technology
1 CSIRO Australia
1 Thünen Institute of Market Analysis
1 EMPA
CONNECTING THE DOTS – SIMPLIFYING COMPLEXITY THROUGH INTEGRATED TECHNOLOGIES

Moderation: Dr. Ulrike Bos, Senior Manager GaBi Content at Sphera

Learn how an integrated technology approach can help your organization address and manage present and future sustainability and ESG challenges. Engage with Sphera’s experts and learn about the business benefits of integrated sustainability and ESG solutions. Share your key challenges and requirements to better tailor technologies to your needs.

Speakers || Presenters:
Sebastian Schulz
Team Lead Product Management PS at Sphera

Harald Florin
Vice President Product Sustainability Solutions at Sphera

Emanuela Scimia
Managing Director Italy and Director Consulting at Sphera
LIFE CYCLE THINKING IN COMPANIES AND ORGANIZATIONS

Sessions Chairs:  
Rydberg, Maria  || Swedish Life Cycle Center  
Reinsch, Bernd  || Robert Bosch GmbH

Assessing the Economic Dimension of the Circular Economy in Companies and Guidance for Implementation  
Wege, Elena¹; Salvasohn, Lara  ||Robert Bosch GmbH

The product-market system approach to adopt life-cycle thinking in organisation management  
Mancinelli, Raimondo¹; Wehrmeyer, Walter; Lee, Jacquetta; Arena, Noemi; Reeves, Kevin; Embley, Tim

Steps to mainstream sustainability assessment in the decision-making process of Colruyt Group  
Van Hemelryck, Steven¹; Adibi, Naeem; McHardy, Cara; Voorend, Wannes  ||Colruyt Group Services

Government collaboration for increased application of life cycle thinking in society  
Wikström, Anna¹; Toller, Susanna; Einarsson, Kristina; Spak, Björn; Thornéus, Joakim; Palander, Sara; Rydberg, Maria

Leaving instrumental explanations in the toolbox – towards a more nuanced understanding of LCA in sustainable product development  
Beemsterboer, Sjouke¹  ||Chalmers Institute of Technology
DIGITAL TECHNOLOGIES FOR A CIRCULAR ECONOMY

Sessions Chairs: Baumgartner, Rupert J. || University of Graz
Nebel, Barbara || Thinkstep ANZ

Digital battery passports as supporting tool for sustainable battery life cycle management
Berger, Katharina1; Baumgartner, Rupert J.; Weinzerl, Martin; Bachler, Johann; Schöggl, Josef Peter

The potential of digital technologies for sustainable product management
Rusch, Magdalena1; Schöggl, Josef Peter; Baumgartner, Rupert J.

Automated LCA for Complex Products (e.g. Consumer Electronics, Vehicle)
Schiffleitner, Andreas1; Prox, Martina; Wahl, Anne

Building a Sustainable Future Based on Innovation and Digitalization
Walden, Gunther1; Adam, Kathrin1; Prox, Martina1

Drivers and limitations of a blockchain-based information exchange system for LCA – Insights from the aerospace sector
Galindo Schaly, Sebastian1; Strehle, Elilas; Pukies, Gaston
MAINSTREAMING CONSTRUCTION LCA – BASED ON AN OPEN DATA NETWORK

Sessions Chairs: Donath, Christian I ECO Platform AISBL
Röder, Alexander I Institut Bauen und Umwelt e.V.
Kusche, Oliver I ok*worx

Levels, supporting assessment and reporting of life cycle performance of buildings
Lindblom, Josefina I European Commission – DG Environment

Mainstreaming Construction LCA – Based on an Open Data Network
Donath, Christian I ECO Platform AISBL

Mainstreaming production of digital EPDs in Holcim
Vlasopoulos, Nikolaos I Holcim Innovation Center; Brun, Sandrine; Kessler, Benoit; Vogl, Christopher; McEwen, Laurel

An open data network for environmental information on construction products
Kusche, Oliver I Oliver Kusche Research & Consulting

Handling of digital data in building LCA tools exemplified by Generis®
Horn, Rafael I Fraunhofer Institute for Building Physics IBP; Borschewski, David; Ebertshäuser, Sebastian; Jäger, Michael; Mahler, Boris
FUTURE SUSTAINABLE LIFESTYLES – URBAN STRUCTURE

Sessions Chairs:  
Brunklaus, Birgit II RISE Research Institutes of Sweden AB  
Kreißig, Johannes II DGNB e.V. – German Sustainable Building Council

Environmental co-benefits and trade-offs of climate mitigation strategies  
applied to net-zero-emission neighbourhoods  
Lausselet, Carine¹

Environmental and land use consequences of replacing milk and beef with  
plant-based alternatives in Germany  
Porto Costa, Marcela; Saget, Sophie; Zimmermann, Beate; Petig, Eckart; Angenendt, Elisabeth;  
Rees, Robert; Chadwick, David; Gibbons, James; Shrestha, Shailesh; Styles, David¹ ¹University of Limerick

The environmental impacts of urban transportation alternatives in Brazil:  
A LCA to promote conscious consumption in urban mobility  
Avilan, Felipe; Iwasaka, Fernanda¹; Souza, Amanda²

User centred design and energy efficient packaging collection infrastructure  
supporting circular future lifestyles  
Brunklaus, Birgit¹; Ordoñez, Isabel²; Svärd, Lotta; Gemfors, Fredrik

Spatial configurations of urban waste management systems considering  
local uses of recovered products  
Tanguy, Audrey¹; Laforest, Valérie; Glaus, Mathias

¹NTNU ¹¹University of Limerick ²BASF – Fundação Espaço ECO ³RISE Research Institute of Sweden AB ²Elisava – Barcelona School of Design and Engineering ¹Mines Saint-Etienne
THE ROLE OF INDUSTRY IN SUSTAINABLE SUPPLY CHAINS

Sessions Chair: Knüpffer, Eva II Fraunhofer IBP

Adequate Framework, Process, Method, Data and Communication for consistent and successful Decarbonization over the Supply chain
Baitz, Martin1; Bos, Ulrike; Kupferschmid, Stefan; Premer, Stefan; Partl, Hannes 1Sphera Solutions GmbH

Challenges and requirements of exchanging Product Carbon Footprint information in the supply chain
Jaeger, Florian Ansgar1; Saling, Peter; Dencic, Ivana; Rehl, Torsten; Steidle, Rebecca; Wang, Jing; Létinois, Ulla 1Siemens AG – Corporate Technology

TED – transferring environmental data
Tietze, Ann-Carina1; Schüler, Maximilian 1Volkswagen AG

Preparing for the new Supply Chain Law – A Conceptual Paper introducing the Opportunities and Boundaries of a Digitalized Supply Chain
Lother, Hanna1; Schaefer, Peter1; Rödger, Jan-Markus1 1umlaut SE

An open ecosystem for the exchange of trusted product footprints along supply chains
Hohlweck, Jonas; Beiting, Gunter1; Albrecht, Florian; Kind, Andreas; Dietz, Martin; 1Siemens AG Müller, Katrin; Jaeger, Florian Ansgar
SUSTAINABILITY ASSESSMENTS IN INDUSTRY CREATING MEANINGFUL INFORMATION

Sessions Chairs:  
Saling, Peter Ⅱ BASF SE  
Becker, Beatrix Ⅱ Evonik Operations GmbH  
Schowanek, Diederik Ⅱ Procter & Gamble  
Otte, Nikolaj Ⅱ Henkel AG & Co. KGaA

Bringing PEF labelling into practice: Lessons from the Decorative Paints Certification Pilot  
Chebaeva, Natalia¹; Kumar, Karthik Ashok; Sonnen, Max; Huguet Ferran, Pau ¹Ecomatters B.V.

Classifying indicators to manage the transition to circular business models:  
A systematic literature review  
Johnson, Emma¹; Heldt, Lisa; Brambila, Sergio ¹Lund University

Digital Business Solution – Life Cycle Models to create KPIs for industrial decision-making processes – Example of biopolymer PHA as a sustainable packaging concept for the cosmetic industry  
Harsch, Matthias; Saiger, Maximilian¹ ¹LCS Life Cycle Simulation GmbH

The carbon footprint and wider life cycle impacts of inhaler devices and asthma exacerbations  
Whiting, Andy¹; Aumônier, Simon; Collins, Michael; Calnan, Aoife; ¹ERM  
Brick, Nathan; Aumônier, Riley

How are we performing? Supporting companies in interpreting their Carbon Footprint with industry benchmarks  
Tesch, Jasmin¹; Forin, Silvia ¹WifOR Institute
TOOLS, METRICS AND LABELS FOR A CIRCULAR ECONOMY

**Sessions Chairs:**
- **Psarra, Lina**  
  Rockfon, part of ROCKWOOL Group
- **Kral, Iris**  
  denkstatt GmbH

**Benchmark of circularity indicators and links with life cycle assessment**

*Saidani, Michael*

Le Pochat, Stéphane; Monteil, Aude; Yannou, Bernard; Garcia, Jade; Osset, Philippe

1 CentraleSupélec

**The role of MFA and LCA to generate a dashboard of indicators for the creation of a circular plastic industry in South Africa**

*Goga, Taahira*

von Blottnitz, Harro; Harding, Kevin

1 University of Cape Town – PhD Candidate

**Comparative assessment of Circularity indicators. The case of Reusable Plastic Crates**

*Batlle-Bayer, Laura*

Bala, Alba; Fullana-i-Palmer, Pere

1 Escola Superior de Comerç Internacional, ESCI-UPF

**Incorporating circularity in LCA tools**

*Schumacher, Laura*

Valencia Martinez, Elsa

1 PRé Sustainability

**A tool to determine the optimal environmental lifetime of circular products**

*Hummen, Torsten*

Desing, Harald

1 Robert Bosch GmbH
BUILDING INFORMATION MODELING (BIM) AND LIFE CYCLE ASSESSMENT

Sessions Chairs: Osset, Philippe || Solinnen
Hollberg, Alexander || Chalmers University of Technology

Semantic BIM models as inputs for semantic LCI models
Navarrete Gutiérrez, Tomás1; Hahn Menacho, Álvaro José; Boje, Calin; Benetto, Enrico 1Luxembourg Institute of Science and Technology

Parametric LCA as a Decision-Making Support Tool in Pre-Design Phases
Ebert, Samuel1; Hollberg, Alexander; Hollberg, Philipp 1Technical University Munich

Analysis of current practice and future potentials of LCA in a BIM-based design process in Germany
Schumacher, Rebecca1; Theissen, Sebastian; Höper, Jannick; Drzymalla, Jan; 1LIST Digital GmbH & Co. KG
Hollberg, Alexander; Forth, Kasimir; Schneider-Marin, Patricia; Wimmer, Reinhard;
Bahlau, Sascha; Meins-Becker, Anica; Lambertz, Michaela;

Using standards to maximise the benefit of digitisation of construction product Environmental Product Declaration (EPD) to reduce Building Life Cycle Impacts
Anderson, Jane1; Rønning, Anne 1The Open University

Renovation of Existing Buildings in Different Climate Zones of France Based on Life Cycle Assessment as a Response to Climate Change
Ma, Fujing1; Vogt Wu, Tingting; Laratte, Bertrand; Perry, Nicolas 1Arts et Métiers ParisTech
LIFE CYCLE DATA SUPPORTING SUPPLY CHAIN MANAGEMENT

Sessions Chairs: Rydberg, Tomas | IVL Swedish Environmental Research Institute
Berlin, Johanna | RISE Reserach Institutes of Sweden AB

Using Blockchain to Change the Way We Manage Life Cycle Data for Coffee Supply Chains
Jattke, Marleen; Itten, René; Stucki, Matthias; Ortiz, Carlos; Kanyange, Nadine | Zurich University of Applied Sciences

Footprint data certified stepwise and communicated by blockchain through value chain
Carlsson, Raul; Lindahl, Lars-Åke; Lindblom, Erik; Rissanen, Erik; Dahllöf, Lisbeth; Wohlén, Mattias; Wanemark, Joel | RISE Reserach Institutes of Sweden AB

Digital Lifecycle Record for the Circular Economy
Hagedorn, Tabea; Plociennik, Christiane; Schebek, Liselotte; Vogelgesang, Malte; Pourjafarian, Monireh; Rickert, Julian; Ciroth, Andreas; Benner, Wladislaw | TU Darmstadt

Building System Carbon Framework – reporting whole life carbon to reach net zero built environment
De Giovanetti, Luca; Hunziker, Roland | WBCSD

Digital & verified sustainability information – Are we really there yet?
Rehberger, Max; Duque Cici, Natalia | TÜV SÜD Product Service GmbH
OPERATIONALISING LIFE CYCLE SUSTAINABILITY ASSESSMENT

Sessions Chairs:  
Cordella, Mauro || TECNALIA  
Masoni, Paolo || Ecoinnovazione srl

Gomez Trillos, Juan Camilo1; Brand, Urte; Vogt, Thomas  
'DLR – Institute of Networked Energy Systems

How to define supply chains for practical LCSA: application to an energy system  
Martín-Gamboa, Mario1; Dufour, Javier; Iribarren, Diego  
'Universidad Rey Juan Carlos, Spain

Demarchi + Ecoefficient: the importance of engagement in ecoefficient management of industrial operations  
de Moraes, Adriana Grazielai; Venâncio, Rebeca; Silva, Max  
'BASF – Fundação Espaço ECO

How circular economy strategies could be considered in Life Cycle Sustainability Assessment of products – conclusions from a literature review  
Bachmann, Till M.; Hackenhaar, Isadora1; Huysveld, Sophie; Horn, Rafael; Gehring, Florian; Dewulf, Jo; Charter, Martin  
'Ghent University

Six (potential) Misunderstandings on Attributional Life Cycle Assessment  
Finnveden, Göran1  
'KTH Royal Institute of Technology
LIFE CYCLE INNOVATION TO DRIVE SUSTAINABILITY AND BUSINESS PERFORMANCE

Sessions Chairs:  
Alles, Carina || Swiss Federal Office of Energy  
Fava, Jim || Anthesis Group

Driving Uptake and Increasing Value of LCA for Product Evaluation and Innovation Decisions: A Rapid Prototyping Pilot  
Fava, James¹; Cowen, Lina; Evers, David; Faludi, Jeremy; Meyer, David; Vigon, Bruce; ________ ¹Anthesis Group  
Zeman, Jeff; Nebel, Barbara; Koehler, Stefanie; Heiler, Dustin

Social innovation and workplace development for social entrepreneurship  
Valente, Clara¹; Rubach, Synnøve ____________________________________________ ¹Norwegian Institute for Sustainability Research NORSUS

Life Cycle Thinking as an integral part of entering a new business-field:  
From PVC windows to sustainable wooden houses  
Ko, Nathanael¹; Bäässler, Tilman; Bäässler, Benjamin ____________________________________________ ¹oeko-ko.de

Stay with us for interactive discussions! LCA in innovation processes  
Question 1: Where do we want to be?  
Question 2: What are the barriers to realizing this vision/opportunity?  
Alles, Carina¹; Fava, Jim² and all Session Participants ____________________________ ¹Swiss Federal Office of Energy ²Anthesis Group

Continuation of interactive discussions on LCA in innovation processes  
Question 3: How do we get there and overcome these barriers? – Path forward and wrap-up  
Alles, Carina¹; Fava, Jim² and all Session Participants ____________________________ ¹Swiss Federal Office of Energy ²Anthesis Group
CIRCULAR ECONOMY AND CIRCULAR SOCIETY IN LCM

Sessions Chairs: Briem, Ann-Kathrin II University of Stuttgart  
Jenne, Andreas II REHAU Group

Circularity of consumer electronics within Life Cycle (GAP) Analysis  
Dieterle, Michael$; Lätsch, Corinna$; Nioac de Salles, Ana Claudia  
$Fraunhofer Institute for Chemical Technology ICT

Direct and indirect environmental effects of service lifetime extension of mobile internet-enabled devices  
Itten, René$; Jattke, Marleen; Bieser, Jan; Stucki, Matthias  
$Zürich University of Applied Sciences

reciChain – Closing the loop in a social and responsible way  
Souza, Amanda$; Viñas, Rafael  
$BASF – Fundação Espaço ECO

Adding Transparency to Circular Flow of Batteries  
Fallahi, Sara$; Diener, Derek$; Kazmierczak, Karolina; Calderon, Pavel  
$RISE – Research Institutes of Sweden AB

Four-eyes principle in circular economy: bringing the necessary trust and transparency to metrics and labels  
Duque Ciceri, Natalia$; Rehberger, Max  
$TÜV SÜD Product Service GmbH
Schedule

WEDNESDAY, 08 SEPTEMBER
08:45 – 17:45 CEST

HOST-SESSION FROM FESTO
09:00 – 09:30 CEST

KEYNOTE SPEECH
09:30 – 10:00 CEST

PANEL DISCUSSION
10:00 – 10:30 CEST
Building a Sustainable Future Based on Innovation and Digitalization

Moderators: Rebecca Freitag and Dr. Hannes Krieg

08:45 – 09:00 CEST
Beginning of the conference day || Getting in the mood for the day

09:00 – 10:30 CEST
Host-Session from Festo
Sustainable future paths for industry – bringing together the ecological and digital transformation

Bringing together the ecological and digital transformation opens the room to enable industrial value creation, business models and production processes in a sustainable, resource-efficient and circular way.

Speakers || Presenters:
Dr. Elias Knubben, Vice President Research and Innovation at Festo SE & Co. KG
Dr. Heinrich Frontzek, Vice President Corporate Communication at Festo SE & Co. KG

Keynote Speech by Prof. Dr. Dirk Messner, President of the German Environment Agency (UBA)
The Missing Link: Merging Sustainability Transformations and Digitalization

Panel Discussion
Panel Discussion organized by the Plattform Industrie 4.0
Sustainable production – actively shaping the ecological transformation with industry 4.0

Moderation:
Janina Henning, Community Manager Sustainability, Plattform Industrie 4.0

Speakers || Presenters:
Prof. Dr. Dirk Messner, President of the German Environment Agency (UBA)
Prof. Dr. Frank Piller, Institute for Technology and Innovation Management (TIM), RWTH Aachen University; Working Group Digital Business Models, Plattform Industrie 4.0
Dr. Carsten Polenz, Vice President, SAP SE; Member of the Steering Committee, Plattform Industrie 4.0
Lisa-Alexandra Unkelhäuser, Senior Partner, Bosch Climate Solutions GmbH
Prof. Dr. rer. nat. Liselotte Schébek, Chair of Material Flow Management and Resource Economy, TU Darmstadt; Scientific Director at Fraunhofer IWKS
Dr.-Ing. Johannes van der Beek, Group Director R&D / Design & Engineering and Member of the Executive Board, MOSCA GmbH

10:30 – 10:45 CEST
Coffee Break
Schedule

WEDNESDAY, 08 SEPTEMBER
08:45 – 17:45 CEST

PREVIEW LCM 2023
16:45 – 17:00 CEST

BEST ORAL PRESENTATION || BEST POSTER
17:00 – 17:30 CEST
Building a Sustainable Future Based on Innovation and Digitalization

Moderators: Rebecca Freitag and Dr. Hannes Krieg

12:15 – 13:15 CEST Lunch Break
13:15 – 13:30 CEST Refresh after Lunch
13:30 – 15:00 CEST Parallel-Session Slot 2  ||  WE.2.A – WE.2.E
15:00 – 15:15 CEST Coffee Break
16:45 – 17:00 CEST Preview of the LCM 2023
17:00 – 17:30 CEST Announcement of the best oral presentation  ||  best poster
17:30 – 17:45 CEST Take Home-Message  ||  End of the conference day
Schedule

WEDNESDAY, 08 SEPTEMBER
10:45 – 16:45 CEST

SESSION SLOT 1 || WE.1.A – WE.1.E
10:45 – 12:15 CEST

SESSION SLOT 2 || WE.2.A – WE.2.E
13:30 – 15:00 CEST

SESSION SLOT 3 || WE.3.A – WE.3.E
15:15 – 16:45 CEST
WE.1.A

LIFE CYCLE SUSTAINABILITY IN CONSTRUCTION AND RENOVATION OF BUILDINGS

Sessions Chairs: Schau, Erwin M. || InnoRenew CoE
Palumbo, Elisabetta || RWTH Aachen University

Life cycle assessment of smart buildings
Pannier, Marie-Lise; Bigaud, David
1Université d’Angers

Cost-benefit analysis of the means of access used in maintenance actions
Ferreira, Cláudia; Dias, Ilídio; Silva, Ana; de Brito, Jorge; Flores-Colen, Inês
1IST-ID

Greenhouse gas emission and sustainability of green roofs and storm water system on a district level – comparisons with a lifecycle perspective
Schade, Jutta; Mukkavaara, Jani; Brunklaus, Birgit
1RISE – Research Institutes of Sweden AB

Implementing artificial intelligence techniques to predict enviromental impacts: case of construction products
Koyampambath, Anish; Adibi, Naeem; Szablewski, Carolina; Adibi, Sierra A; Sonnemann, Guido
1Université de Bordeaux/
ISM-CyVi

The relevance of the building system boundary to conduct an LCA of a passive house: A comparison of two frameworks for assessing building sustainable performance DGNB and Level(s)
Palumbo, Elisabetta; Soust-Verdaguer, Bernardette; Llatas, Carmen; Traverso, Marzia
1Universidad de Sevilla
WE.1.B

SDG AS A BASIS FOR SUSTAINABILITY ASSESSMENTS OF PRODUCTS AND COMPANIES

Sessions Chairs:  Saling, Peter  II  BASF SE
                Morel, Stéphane  II  Quantis

SDG based Portfolio-Sustainability-Assessment
Zilberfarb, Noël 1
1ARKEMA

Three pillars, six capitals, seventeen SDGs, one single score – A unified framework for quantification of progress towards sustainable development
Weidema, Bo 1
1Aalborg University

Sustainability evaluation of products – identifying product related SDGs and indicators
Eberle, Ulrike; Wenzig, Julius 1
1University of Witten/Herdecke

Social Hotspot Assessment based on SDG within the SEEbalance® approach
Saling, Peter 1
1BASF SE

Linking the UN Sustainable Development Goals to life cycle impact frameworks: case study findings
Harmens, Rosan 1
1PRé Sustainability B.V.
METHODOLOGICAL APPROACHES TO ASSESS LIFE CYCLE CONSEQUENCES

Sessions Chairs: Fröhling, Magnus || TU Munich (TUM)
Hiete, Michael || Ulm University

Environmental consequences of policies in construction sector: combining economic simulation with consequential LCA
Tavares lima de almeida, Denise¹; CHARBUILLET, Carole; Marotte, Charlotte; ________________ ¹Arts et Métiers ParisTech
Lebert, Alexandra; Perry, Nicolas

How can the End of Life of automotive polymers be considered in Life Cycle Assessment? – A scenario based evaluation of the current End of Life situation
Haun, Patrick¹; Müller, Philipp; Traverso, Marzia ________________________________ ¹Dr. Ing. h. c. F. Porsche AG

Prediction on the recovery of future timber volumes to strengthen consequential LCA approaches of cascading timber: the PRecTimber model
Szichta, Pia¹; Risse, Michael; Weber-Blaschke, Gabriele; Richter, Klaus ________________ ¹ Technische Universität München

A framework for linking the planetary boundaries to organizational LCAs
Oosterhoff, Hendrik¹; Golsteijn, Laura; Ryberg, Morten Walbech; Laurent, Alexis ________________ ¹ PRé Sustainability

Application of entropy production to compare the environmental sustainability of industrial processes in Entropy-LCAs
Rapf, Matthias¹; Tang, Longhan; Pekgil, Gizem; Kranert, Martin ________________________________ ¹ University of Stuttgart,
Institute for Sanitary Engineering,
Water Quality and Solid Waste Management
SUSTAINABILITY OF BUSINESS MODELS AND INNOVATIONS

Sessions Chairs: Nilsson-Lindén, Hanna II RISE Reserach Institutes of Sweden AB
Lang-Koetz, Claus II Pforzheim University

Industrial Symbiosis – When disposed Machining Knifes become Raw Material
Hagedorn, Wiebke1; Greiff, Kathrin; Biene, Katrin ____________________________ 1Wuppertal Institute for Climate, Environment and Energy

Could battery swapping stations make micromobility more environmentally sustainable? A comparative LCA study with shared electric scooters and electric mopeds.
Finke, Sebastian1; Schelte, Nora; Severengiz, Semih; Kähler, Ferdinand ____________ 1Bochum University of Applied Sciences

Switching the focus from product function to business profit: Introducing business model LCA
Baumann, Henrikke1; Böckin, Daniel; Goffetti, Giulia; Tillman, Anne-Marie; Zobel, Thomas ______ 1Chalmers University of Technology

Experimentation, development and systematic integration of an ecodesign process within a large retail company – case of Colruyt Group
McHardy, Cara1; Van Hemelryck, Steven; Adibi, Naeem; Voorend, Wannes ____________ 1Colruyt Group Services

Water and energy to whisky: What is the eco-efficiency of heat recovery in distilleries?
Schestak, Isabel1 ________________________________ 1Bangor University
GREEN-LEAN-DIGITAL

Sessions Chairs:  Hohmann, Andrea  II  Fraunhofer IGCV  
Rummel, Silvia  II  Festo SE & Co. KG

Connecting reliability and sustainability considerations in mechanical & civil engineering design to reduce oversizing without risking disasters
Dazer, Martin¹; Ostertag, Andreas; Herzig, Thomas; Albrecht, Stefan; Bertsche, Bernd  
¹Universtität Stuttgart

Workflow automation for multi-purpose LCA of large product portfolios
Wehner, Daniel¹; Betten, Thomas; Prenzel, Tobias Manuel; Briem, Ann-Kathrin;  
¹Fraunhofer-Institut für Bauphysik IBP

Accelerating sustainable development and production of nano-materials and printed electronics
Prenzel, Tobias Manuel¹; Gehring, Florian; Davis, Zachary J.  
¹Fraunhofer IBP

Internet-of-Things Enabled Hotspot Analysis with Dynamic Life Cycle Inventory
Cornago, Simone¹; Tan, Yee Shee; Ramakrishna, Seeram; Low, Jonathan Sze Choong  
¹Singapore Institute of Manufacturing Technology, National University of Singapore

An inclusive, sustainable and connected society? IoT implementation in a Swedish municipality
Lindén, Hanna¹; Chiew, Yoon Lin; Centerholt, Victor; Saarikko, Ted; Lundstrom, Anders  
¹RISE Reserach Institutes of Sweden AB
LIFE CYCLE SUSTAINABILITY IN CONSTRUCTION AND RENOVATION OF BUILDINGS II

Sessions Chairs: Schau, Erwin M. InnoRenew CoE
Palumbo, Elisabetta RWTH Aachen University

Life cycle sustainability assessment of a residential building project in northeast China
Dong, Yahong; Liu, Peng Qingdao University of Science and Technology

Analysis of the production of traditional and alternative wall-building materials in Vietnam
Ruf, Lavinia; Schwede, Dirk; Nguyen Van, Tuan; Bui, Quoc-Bao; Le Thi, Song; Stergiaropoulos, Konstantinos
University of Stuttgart, Stuttgart, Germany

Life Cycle Assessment of Advanced Insulation Materials towards NZEBs
Antypa, Despoina; Sieti, Natalia; Vlysidis, Anestis; Gkika, Anastasia; Kraft, Robert; Böhm, Robert; García, Ignacio; Subrahmanyam, Raman; Smirnova, Irina; Koumoulos, Elias; Petrakli, Foteini IRES—Innovation in Research & Engineering Solutions

Challenges to build a national system for quantifying the Life Cycle carbon footprint of buildings
Wiche, Pia; Rodríguez Droguett, Bárbara; Granato, Danilo EcoEd

Potentials for emission reduction and value creation in the rehabilitation of existing building stock using macroeconomic analysis
Perez-Valdes, Gerardo A.; Fufa, Selamawit; Fjellheim, Kristin SINTEF Industry
WE.2.B

SOCIAL LIFE CYCLE ASSESSMENT OF PRODUCTS

Sessions Chairs:  Traverso, Marzia  ||  RWTH Aachen University
                 Finkbeiner, Matthias  ||  TU Berlin

Social life cycle assessment of free-floating car sharing: a case study in Berlin
Gompf, Katharina¹; Traverso, Marzia; Hetterich, Jörg  'BMW Group / RWTH Aachen University

UNEP 2020 Guidelines for Social Life Cycle Assessment of products and Organizations and their Pilots
Traverso, Marzia¹; Benoît-Norris, Catherine; Valdivia, Sonia; Finkbeiner, Matthias; Schaubroeck, Thomas; Berger, Markus; Neugebauer, Sabrina; Arcese, Gabriella; Russo Garrido, Sara; Ekener, Elisabeth; Mankaa, Rose Nangah

Social Life Cycle Impact Assessment of Poultry Production in Indonesia
Saputra, Sharah Yunihar; Yunus, Khalda; Marcellina; Hanafi, Jessica¹; Adibi, Naeem¹; Van Hemelryck, Steven; McHardy, Cara; Voorend, Wannes  'WeLOOP

Social LCA application based on the SEEbalance® approach
Saling, Peter¹  'BASF SE

Developing socio-economic indicators for overall life cycle sustainability assessment of retail sector – case of Colruyt Group
Adibi, Naeem¹; Van Hemelryck, Steven; McHardy, Cara; Voorend, Wannes  'WeLOOP

Social Life Cycle Assessment for informal settings: the experience from the recycling system of Cuenca, Ecuador
Cabrera, Fanny; Pacheco, Gustavo; Vanegas, Paúl; Sucozhañay, Dolores¹  'Universidad de Cuenca
BENEFITS OF RETAINING MATERIALS AND THEIR QUALITY IN A CIRCULAR ECONOMY

Sessions Chairs: Hummen, Torsten II Robert Bosch GmbH
Dewulf, Jo II Ghent University

Circular economy concepts for a plastic loop – comparing mechanical and chemical recycling regarding material quality
Stallkamp, Christoph¹; Volk, Rebekka; Schultmann, Frank
¹KIT – Karlsruher Institut für Technologie

How pyrolysis as chemical recycling technology contributes to a circular carbon economy as analysed by LCA
Horlacher, Maike¹; Deregowski, Carolin¹
¹Sphera Solutions GmbH

Applying cascading and substitution principles for a careful resource use in wood based-products
Ott, Stephan¹; Wagner, Anna¹
¹Technical University Munich

Effectively preserving material quality by design
Hummen, Torsten¹
¹Robert Bosch GmbH

Statistical entropy analysis to evaluate cascading use of wood and its impact on material circularity
Navare, Kranti¹; Vrancken, Karl C.; Van Acker, Karel
¹KU Leuven
BENEFITS

WE.2.D

BUSINESS LIFE CYCLE NETWORKS

Sessions Chairs: Bajaj, Sanjeevan II Forum for Sustainability through Life Cycle Innovation e.V.
Chapman, Sonia Karin II Rede Empresarial Brasileira de Avaliação de Ciclo de Vida (Rede ACV)

Streamlining environmental footprinting by utilising corporate footprints
Williams, Ellie1; Vieira, Marisa _____________________________________________ 1PRé Sustainability

Rede ACV, the Brazilian Business Life Cycle Network
Chapman, Sonia Karin1 ____________________________________________________ 1Rede ACV

Engaging stakeholders in local and regional Life Cycle Management decision-making for urban planification
Bolle, Clément1; Szablewski, Carolina; Adibi, Naeem ____________________________ 1WeLOOP

Making an impact through joint efforts – Values, outcomes and lessons from 25 years of collaboration
Palander, Sara1; Wikström, Anna; Rydberg, Maria ______________________________ 1Chalmers University of Technology/Swedish Life Cycle Center

FSLCI – A community approach to driving Life Cycle Innovation globally
Bajaj, Sanjeevan1; Prox, Martina; Sonnemann, Guido; Strothmann, Philip; Fava, James ________ 1Forum for Sustainability through Life Cycle Innovation e.V.
Mobilizing LCA Resources through Digital Collaboration

**Sessions Chairs:**
- Mieras, Eric || PRé Sustainability
- Wright, Laurie || Solent University

Research institute strengthens its LCA capacity by internal collaboration and data infrastructure
Carlsson, Raul\(^1\); Davis, Jennifer; Edoff, Petra; Karpenja, Tatjana; Lorentzon, Katarina; Rex, Emma

High-quality Recycling through self-learning and resilient Recycling Networks using a Combination of Agent-Based Modelling and Life-Cycle Assessment
Brinkmann, Tobias\(^1\); Steinfeldt, Michael\(^1\); Spuziak-Salzenberg, Detlef; Arndt, Carmen; Carstens, Anna; Albers, Henning; Stührmann, Torben; Germer, Frauke

Decentralized LCA in innovation and reporting processes of a large enterprise
Otte, Nikolai\(^1\); Tolls, Johannes; Christine, Schneider; Klemmer, Anna; Kremer, Joachim

How to train artificial intelligence to improve industrial applicability of life cycle assessment
Thore, Andreas; Carlsson, Raul\(^1\)

Equipment and human factor in geographically dispersed simultaneous data gathering: case of The Ultimate Cheeseburger online experiment
Ristic, Dusan\(^1\); Jäger, Henry; Smetana, Sergiy; Heinz, Volker
WE.3.A

BUSINESS MODELS FOR A CIRCULAR ECONOMY

Sessions Chairs:  
Mellquist, Ann-Charlotte  
II RISE Research Institutes of Sweden AB

Rex, Emma  
II RISE Research Institutes of Sweden AB

Circular business model implementation in practice: Learnings from the case of electric vehicle batteries
Schulz-Mönninghoff, Magnus¹; Bey, Niki; Niero, Monia  
¹Mercedes Benz AG

Remanufacturing business model cases for a Circular Economy
Oiko, Olívia¹  
¹Universidade Estadual de Maringá

Explorative approach to circular business structures in the magnet industry
van Nielen, Sander¹; Kleijn, René; Miranda Xicotencatl, Brenda  
¹Leiden University

The potentials to capture circular economy values in the energy sector through business models
Doumit, Farah¹; Michel, Axel  
¹Engie/Polytechnique

Exploring reluctance to circular business models – the case of light as a service
Rex, Emma¹; Kron, Ulrika  
¹RISE Research institutes of Sweden AB
SDG CORPORATE RESPONSIBILITY

Sessions Chairs:  Barkmeyer, Mercedes  || Festo SE & Co. KG
                Maslo, Andreas  || Verso GmbH
                Holl, Florian  || Verso GmbH

Creating impact by integrating the SDGs in a company strategy
Morao, Ana1; Visser, Diana  || Corbion

Assessing the Impact of Electrolytic Hydrogen Production on the Sustainable Development Goals – Early Results and Way Forward
Portner, Benjamin W.1; Weidema, Bo; Moser, Leonard  || Bauhaus Luftfahrt e.V.

Life cycle impacts of Electrolux domestic washing machines and proposal for their impact reduction
Zuin, Stefano1; Saitov, Rustem; Celotto, Monica; Stabon, Elisa; Nori, Michele;  || Electrolux Italia SpA
Colombera, Giovanni

Approach for assessing environmental handprints
Lakanen, Laura1; Grönman, Kaisa; Kasurinen, Heli; Vatanen, Saija; Pajula, Tiina;  || LUT University
Behm, Katri; Soukka, Risto

A tool for the streamlined sustainability assessment of emerging technologies in resource-intensive industries
Buchner, Georg A.1; Klose, Svenja; Glardon, Oliver; Fröhling, Magnus  || Technical University of Munich
Consequential vs. attributional approach to the LCA of zinc recovery from spent pickling acids
Arguillarena, Andrea; Margallo, María; Urtiaga, Ane

Sustainability of demolition waste management in the framework of circular economy roadmap – a case study in Luxembourg
Guiton, Mélanie; Bertrand, Alexandre; Ehlert, Christina

Implementation of LCA to support circular process development for extraction of CRMs from seawater brines
Yılmaz, Özge; Uysal, Çınar; Papapetrou, Micheal

Life Cycle analysis of a refurbished smartphone in Chile
Pequeño Leclerc, Felipe; Granato, Danilo; Wiche, Pia

The role of LCA in eco-innovation. The particular case of the FlashPhos sustainable process
Muñoz Marín, Encarnación; Cascajo, Jose Maria; Rapf, Matthias
LIFE CYCLE MANAGEMENT IN EDUCATION AND CULTURE

Sessions Chairs:  
Lindner, Jan Paul  || Bochum University of Applied Sciences  
Viere, Tobias  || Pforzheim University

Education for optimized Life Cycle Management: The Project e-CIRP and its insights into embedding circular economy aspects to product design via teaching
Graf, Roberta1; Grönman, Kaisa; Balkenende, Ruud; Danese, Pamela; Holopainen, Jani; Luukkonen, Matti; Nevgi, Anne; Nuortila-Jokinen, Jutta; Olsen, Stig; Sandström, Niclas; Tegazi, Stefano

LCA between democratization and expert rule
Koch, Christian1; Fogh Friedrich, Mathilde; Kjøniksen, Anna-Lena; Tellnes, Lars G. F. 1Aarhus University

Sociabill, a Serious Game to educate adults about the S-LCA methodology
Schiller Becerra, Maira Christina; Nangah Mankaa, Rose1 1Institute of Sustainability in Civil Engineering (INaB)

Teaching LCA in higher education– towards global empirical insights
Harding, Kevin; Horta Arduin, Rachel; Miao, Zoe Chunyu; Sonnemann, Guido; Strothmann, Philip; Viere, Tobias1; Wright, Laurie; Zeller, Vanessa 1Pforzheim University
APPLIED DIGITAL SOLUTIONS – CONNECTING GREEN AND DIGITAL TRANSFORMATIONS?

Sessions Chairs: Le Blevennec, Kévin II VITO
Adibi, Naeem II WeLOOP

Industrial Symbiosis Marketplace Concept for Waste Valorization Pathways
Akrivou, Chrysanthi 1; Łękawska-Andrinopoulou, Lucyna 1; Manousiadis, Charalampos 1; Tsimiklis, Georgios; Oikonomopoulou, Vasiliki; Papadaki, Sofia; Krokida, Magdalini; Amditis, Angelos

The Circular Data Centre Compass – a digital tool to model and assess data centre sustainability
Andrews, Deborah 1; Bademci, Bahattin; Adibi, Naeem; Whitehead, Beth; Queck, Oliver 1; Bienge, Katrin; Ye, Zhihui; Szablewski, Carolina; Fryer, Emma; Kerwin, Kristina; Schrijvers, Dieuwertje; O’Callaghan, Ellie;

Materials role in pavement design and its impacts in LCA of road construction and use phase
de Montaignac, Renaud; Vlasopoulos, Nikolaos; Negishi, Koji; Queck, Oliver 1; Wolpert, Frank

Detecting environmental hotspots in extensive portfolios through LCA and data science
Shevelov, Alexander 1; Prenzel, Tobias Manuel; Lebsack, Carina; Wehner, Daniel; Wolpert, Frank

The zero impact factory twin – a case study
Rödger, Jan-Markus 1; Rößling, Oliver 1; Wolpert, Frank
The proceedings of the 10th International Conference on Life Cycle Management (LCM 2021) will be published in an online Open Access journal. The articles are based on the presentations and posters from the LCM 2021, held online from 05 – 08 September 2021.

All presenters are invited to submit their findings, which will be peer reviewed by the session chairs and editors of the LCM 2021.

The LCM (Life Cycle Management) conference series is one of the world’s leading forums for environmental, economic and social sustainability. The focus is on practical solutions for the implementation of life cycle approaches into strategic and operational decision-making, whether in science, industry, NGOs or public institutions.

E3S Web of Conferences is an Open Access publication series dedicated to archiving conference proceedings in all areas related to Environment, Energy and Earth Sciences.

The proceedings will be available Open Access by the end of 2021. All conference participants will be notified once it is released.
HANNES KRIEG
He is an associated expert in Life Cycle and Sustainability Assessment

Hannes Krieg is working as sustainability consultant at EcoSquare Consulting. Before founding EcoSquare, he worked with the Department of Life Cycle Engineering at the University of Stuttgart and Fraunhofer IBP. He has more than 10 years of professional experience in sustainability assessment, specifically in Life Cycle Assessment, Carbon Footprinting and Life Cycle Costing, working on projects in a wide range of industries.

After graduating with a degree in Economics from the University of Hohenheim, he obtained a doctorate in Environmental Engineering from the University of Stuttgart in 2017 with a thesis on the integration of economic and environmental aspects in organizational decision-making. He is a life cycle assessment expert certified by the American Center for Life Cycle Assessment.

REBECCA FREITAG
She is a visionary, an architect of the future and a sustainability expert

During her mandate as the German UN Youth Delegate on Sustainable Development, Rebecca Freitag represented the interests of the young generation at UN conferences on sustainable development and in national politics. Promoting the Sustainable Development Goals (SDGs), she assists young people, businesses and civil society in a transformation towards sustainability. As the Ambassador of the Rights for Future Generations, she challenges our current paradigms and explores ways into a sustainable future.

In order to advance already existing solutions and to promote the achievement of the SDGs in the corporate world as well, she co-founded the Global Impact Alliance, an association of purpose-driven companies. Furthermore, in the field of academia, she explores ways in which sustainability can best be communicated and motivated to be implemented by designing an interdisciplinary sustainability course at the university.
Keynote speakers

Eric Mieras
Auma Obama
Janin Schaffer
Dirk Messner
Hannah Helmke
ERIC MIERAS
He is the Managing Director of PRé Sustainability

Eric Mieras is the Managing Director of PRé Sustainability, a global leader in life cycle assessment software, life cycle information tools and consultancy services. Eric has worked with large corporations, start-ups, academic institutions and SMEs to successfully increase their positive impact on people, planet and profit. He has helped teams and individuals grow professionally, personally and collaboratively.

Eric has extensive experience in working across different industries, scaling up start-ups and innovations with a focus on information technology, professional services and sustainability. He is uniquely positioned to take sustainability metrics mainstream. Eric understands the value of deep technical expertise for broader audiences and knows how to make this knowledge accessible and relevant.

As a linking pin bringing people from different fields together, Eric believes in the power of people, communities and networks that have a shared purpose. That is also how he leads PRé Sustainability, helping the company contribute to positive change with its profound knowledge and vast experience in Life Cycle Information.

In addition to a Master of Law degree in law and environmental studies from Utrecht University, Eric holds a Master of Science in communication studies from the University of Amsterdam and a postgraduate certificate in change management from VU Amsterdam.
Keynote speakers

DR. AUMA OBAMA
She is a German studies specialist, sociologist, journalist and author

Auma Obama was born in Nairobi in 1960 to Barack Obama Senior, a government official, and Kezia Obama, a housewife. She came to worldwide attention when she supported her brother Barack Obama in his 2008 campaign for the office of U.S. President.

Her fascination with German literature helped her win a scholarship from the German Academic Exchange Service, which enabled her to study German and Sociology in Saarbrücken, Heidelberg and Berlin from 1980. After receiving her doctorate in 1996 in Bayreuth, she worked for the Friedrich Ebert Foundation and the Carl Duisberg Society in adult education. As a freelance journalist, she focused on Africa and the Germans’ image of Africa. In 1986, she moved to Great Britain, got married and had a daughter.

Auma Obama’s life theme is and remains her social commitment. After several years with an international aid organization in Africa, she founded her own Auma Obama Foundation “Sauti Kuu” in Germany and Kenya in 2010. “Sauti Kuu” comes from the Kiswahili language and means “Strong Voices” in German. The foundation aims to give disadvantaged children and young people a voice, and to awaken and strengthen their potential.

Despite the fact that she now lives in Nairobi again, the connection to Germany was never broken. Therefore, Dr. Auma Obama travels as a keynote speaker and interview partner on the topic of “ecological, economic and social sustainability” through Germany and the whole world.
PROF. DR. DIRK MESSNER
He is an internationally renowned sustainability researcher

At Germany’s main environment authority, Professor Messner, inter alia, makes sure that there is a healthy environment in Germany which protects people as much as possible from adverse environmental influences, such as pollutants in air and water. The range of topics covered is broad – ranging from waste avoidance to climate protection and pesticide approvals. The internationally renowned sustainability researcher assumed the presidency on January 1, 2020. Furthermore, he is co-director of the “Käte Hamburger Kolleg / Centre for Global Cooperation Research” at the University of Duisburg-Essen.

Professor Messner is an internationally recognized expert in the fields of globalization/global governance, transformation pathways to sustainability, decarbonization of the global economy, sustainability and digital change as well as international cooperation and societal change. Throughout his scientific career, Professor Messner has been involved in various high-ranking policy advisory councils, including co-chairing the German Advisory Council on Global Change (WBGU). Presently, he is, among others, co-coordinator of “The World in 2050”, a global research consortium for the implementation of the Agenda 2030. Prior to joining the German Environment Agency, Messner served as Director of the Institute for Environment and Human Security of United Nations University from 2018-2019 and Director of the German Development Institute from 2003-2018. We are looking forward to Professor Dirk Messner’s LCM 2021 keynote “The Missing Link: Merging Sustainability Transformations and Digitalization.”
HANNAH HELMKE

The most important thing now is to be concrete. We need to understand whether implemented measures are really suitable for steering towards 1.5 °C. Simply reducing emissions, simply promoting innovation, is no longer enough, because we really need to get on track now.

Hannah Helmke is co-founder and CEO of right. based on science, a provider of climate metrics and software. Her focus on economic activity in a world affected by climate change was the result of combining both her academic disciplines: Psychology and International Business. Hannah follows her strong conviction that a science-based approach is the best way to manage the emotionally charged field of corporate climate strategy. Before founding right, she worked for the IT service provider BridgingIT and Deutsche Post DHL Group. There, she explored the potentials of digitization for reaching sustainability targets and worked on introducing science-based targets as reporting instruments.

Under her leadership, right. based on science received the prestigious Next Economy Award 2020. She herself was awarded the Digital Female Leader Award 2020 in the category “Sustainability” as well as the ‘Female Founders Award’ of AmCham Germany in 2021.
DR. JANIN SCHAFFER
She is a physical oceanographer at the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research

Janin Schaffer studied Climate Physics at the GEOMAR, Helmholtz Centre for Ocean Research Kiel. During her training, she joined several research cruises and fell in love with the sea. In 2014, she started working as a physical oceanographer at the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, where she received her doctorate in 2018. Her research focus is on how warming ocean waters contribute to the retreat of tidewater glaciers around the coast of Greenland. Driven by her curiosity to study the physics of the polar oceans, she co-organized and joined many research expeditions to Greenland and Antarctica.

Recently, Dr. Janin Schaffer has taken part in the MOSAiC expedition. Starting in autumn 2019, the German research icebreaker Polarstern has drifted for an entire year with the sea ice through the Arctic Ocean. On the MOSAiC expedition, scientists from 20 nations have set up a research camp on an ice floe to study the ocean as well as sea ice, snow, and the atmosphere in this extreme ice landscape during all seasons. In the past few decades, hardly any other region on earth has changed as much as the Arctic. In recent years, temperatures have risen more than twice as much as the global mean. This not only has an impact on the decreasing sea ice extent, but the changes in the Arctic climate system also affect our weather in the temperate latitudes. One of the many scientific goals of the expedition was therefore to better understand the influence of the Arctic on the global climate.

Dr. Janin Schaffer spreads her passion for the Arctic Ocean to young and old by giving presentations at schools, in societies, on the street and during YouTube events. She provides insights into her exciting measurements in the (turbulent) Arctic Ocean under the MOSAiC floe and reports on unique experiences while working on the ice in the Arctic winter. However, she also talks about the ongoing dramatic changes observed in the Arctic and the urgency for real climate action.
WEDNESDAY 01 SEPTEMBER 2021

Sphaera | Pre-Conference Workshop
11:00 – 12:30 CEST

Keynote
Enabling the Future: Is Net Zero Enough?

The race towards net zero emissions targets is in full swing. But is that enough to combat climate change and secure our future? What instruments are available to the business community to reach net zero and go beyond?

Speaker
Marc Binder, VP Global Sustainability Consulting at Sphera

Panel Discussion
Roadmap Toward Sustainability and ESG Excellence: How Technology, Expertise and Data Can Lead the Way

Sustainable transformation is at the top of the agenda for many companies. The right technology, data, and expertise can help drive efficiencies through synergies, thereby reducing risks and potential costs associated with this process. In this panel discussion, we will talk about how real-world companies are defining and maturing their sustainability programs by integrating sustainability technologies into core business areas.

Moderation: Emanuela Scimia Managing Director Italy and Director Consulting at Sphera and Dr. Rajesh Singh Managing Director India & Southeast Asia at Sphera

Speakers
Prabodha Acharya
Group Chief Sustainability Officer at JSW Group

Alessandro Furno
Technical Director at Bridgestone America

Harsha Reddy Joint
Vice President & Head of Sustainability at Indorama Ventures Pcl

Poster-Pitches | 12:45 – 13:30 CEST

DGNB | Pre-Conference Workshop
13:45 – 15:15 CEST

Why are buildings key for companies aiming to be carbon natural?

Many companies have set out to be carbon neutral by 2030. Business goals take this target into consideration. For the whole business to be carbon neutral, the focus on carbon neutral buildings is crucial. To maximise the contribution buildings can make, we need knowledge and tools such as the certification of buildings.

Speakers
Dr. Stephan Anders, Director of the DGNB Certification

Jürgen Utz, Director of the DGNB Academy
THURSDAY 02 SEPTEMBER 2021

PRé | Pre-Conference Workshop
11:00 – 12:30 CEST

Making LCA results count: how to easily create sector-specific solutions with SimaPro

At this session, you will learn more about the latest developments in SimaPro and will see practical examples of how to easily create revenue-generating sector-specific solutions.

Program
- SimaPro future vision, new features and latest developments
- Practical cases and examples of sector-specific solutions
- Q&A

Speakers
Anneke Haringsma, Sales & Partner Manager at PRé
Reinier Zwiep, Product Owner at PRé
Caspar Honée, Sustainability Solutions Architect at PRé

Fraunhofer IBP | Pre-Conference Workshop
13:45 – 15:15 CEST

GENERIS® – Life-cycle-oriented planning of buildings

The workshop shows the functionalities of the Generis software to generate building life cycle assessments and benchmarks in a targeted and efficient way.

Speakers
Michael Jaeger, Group Leader Sustainable Buildings at Fraunhofer IBP
FRIDAY 03 SEPTEMBER 2021

BASF | Pre-Conference Workshop
11:00 – 12:30 CEST

Strategies, approaches and technologies for the generation of high numbers of Product Carbon Footprints.

Achieving net zero CO₂ emissions by 2050 is a huge challenge for the chemical industry. For the steering of decarbonization carbon footprints help to get transparency. With a standardized methodology companies can identify improvement opportunities including their supply chains. Learn more about our new approach and discuss new opportunities.

Speakers
Dr. Christoph Jäkel, Head of Corporate Sustainability at BASF
Prof. Dr. Peter Saling, Director Sustainability Methods at BASF
Dr. Jan Schöneboom, Global Sustainability Care Chemicals at BASF

Poster-Pitches | 12:45 – 13:30 CEST
Sustainable product development by means of personalization – paradox or solution?

Personalization of products and services entails risks but also potentials for sustainability. During the product development process, it is crucial to take into account the future usage patterns/parameters and their variability. Even if the product itself is not personalized, a user-centred approach during the entire life cycle can unlock many potentials. Avoiding unnecessary functions and tailoring a product precisely to its user’s needs can lead to optimized sustainability performance during its use. Moreover, by developing and offering personalizable products that meet the requirements of the respective user, companies can tap into new market opportunities and increase their competitiveness.

In this workshop we will look at the different opportunities of personalization and discuss this trend from an environmental point of view.

We will address the following questions:
- Which potentials can be unlocked through a user-centred personalization approach?
- How can we integrate and ensure sustainability during the entire process?
- What are the arising challenges and which tools can we use to tackle them?

In this interactive workshop you will get to know the broad spectrum of potentials in the context of personalization. We will discuss the current and future challenges you are facing and how science can contribute to solving some of the issues.

Speakers
Ann-Kathrin Briem, Sustainability expert and project manager at University of Stuttgart IABP
Daniel Ziegler, User Experience expert at Fraunhofer IAO
Towards social sustainability effective supply chains of innovative and established products: Defining the human wellbeing to support
Authors: Mathias Lindkvist¹, E. Ekener ¹KTH Royal Institute of Technology

Indicators for Circular Economy: ICE-T Tool – Evaluation of Circular Economy implementation in a RTO (Research and Technology Organization)
Authors: Josua Guérid¹, E. Cor, S. Desrousseaux, A. Sperandio, E. Monnier ¹Université Grenoble Alpes, CEA, Laboratory of Innovation for new Technologies for Energy and Nanomaterials (LITEN)

Towards Social Life Cycle Assessment Of Energy Systems – Case Study On Offshore Wind Farms From Companies’ Perspective
Authors: Jérémie Lehmann¹, G. Bouillass, R. Fofack-Garcia, P. Pérez-López ¹France Energies Marines / MINES ParisTech

Eco-efficiency Assessment of Pork production through Life Cycle Assessment and Product System Value in South Africa
Authors: Chule Qalase¹, K. Harding ¹University of the Witwatersrand

Are thermodynamic based indicators the solution for assessing circularity of new buildings?
Authors: Diana E.G. Bizarro¹, M. Hauck ¹TNO, The Netherlands Organization for Applied Scientific Research

A Life Cycle based approach for the assessment of Circular Economy strategies for Composite Construction Materials
Authors: Berfin Bayram¹, K. Greiff ¹RWTH Aachen University, Dept. of Anthropogenic Material Cycles (ANTS)

Ex-ante LCA on an emerging electro-mass separation technology:
The importance of the background system
Authors: Ben Maes¹, A. Audenaert, B. Craeye, M. Buyle ¹University of Antwerp
Matching the Supply and Demand within the Circular Economy for Used Electrical and Electronic Equipment applying Condition Assessment
Authors: Sebastina Lawrenz¹, S. Rudolf, S. Blömeke, C. Herrmann, A. Rausch

Ecosystem for reuse of automotive components
Authors: Hanna Nilsson-Lindén¹, E. Sundin, M. Zackrisson, J. Hildenbrand, C. Jonasson, V. Schaller, J. Kurilova, C. Kowalkowski, B. Nansubuga, P. Lundin

Life cycle assessment applied to exploration tools for pegmatites
Authors: Kate Smith¹, R. Pell, X. Yan, F. Wall

ReCircE – Digital Lifecycle Record for the Circular Economy. Transparent design of material cycles and optimization of waste sorting with the help of artificial intelligence
Authors: Tabea Hagedorn¹, A. Lopes, M. Vogelgesang, M. Pourjafarian

The study of LCA based indicators to evaluate the pressure on mineral resources in the building sector
Author: Nada Bendahmane¹

Evaluating circularity potential of various recycling technologies for biocomposites waste from the aircraft industry
Authors: Rajesh Mehta¹, N. L. Miazza, T. van Harmelen, P. Ferrero Aguar

Sustainability assessment of an innovative flotation technology for recovering valuable fine particles
Authors: Lucia Rigamonti¹, G. Cecere, H. Eltohamy

LCA results profiling and visualization applied to R&D in the Powder Metallurgy sector to facilitate information assimilation and eco-design actions
Authors: Emmanuelle Cor¹, T. Baffie, E. Monnier

¹Technische Universität Braunschweig, Institute of Machine Tools and Production Technology

¹RISE Research Institutes of Sweden AB

¹University of Exeter

¹Technical University of Darmstadt, Institute IWAR/ SuR, Department of Civil and Environmental Engineering Sciences

¹Centre Scientifique et Technique du Bâtiment – CSTB

¹TNO, The Netherlands Organization for Applied Scientific Research

¹Politecnico di Milano, Dept. of Civil and Environmental Engineering (DICA)

¹Université Grenoble Alpes, CEA, Laboratory of Innovation for new Technologies for Energy and Nanomaterials (LITEN)
Allocating Recycling Benefits in Life Cycle Assessment for Plastics: Categorization and Use of Product Property Specifications as per Value Chain
Authors: Milad Golkaram\(^1\), R. Mehta

Building material flow characterization allowing the realization of multi-scale circular economy studies: from research to practice
Authors: Rafaela Tirado\(^1,2\), A. Mailhac, S. Laurenceau, G. Habert

Socio-Environmental Capacity Building In Coal Mining Concession Area During Pandemic COVID-19: A sharing from Trubaindo coal mining, East Borneo, Indonesia
Authors: Dewi Permatasari\(^1\), S. Herlambang, B. Cahyono, P. Rahadin, D. Sugiharto

Impact of E-scooter on Sustainable Transportation in a German Student community: A Cohort Investigation
Authors: Rose Nangah Mankaa\(^1\), J. Davis

A Procurement Tool for streamlined Input-Output Sustainability Assessment
Antonia Quell\(^1\); Richard Scholz; Silvia Forin\(^1\)

Sustainable urban wastewater treatment incorporating LCA
Authors: Joana F.J.R. Pesqueira\(^1\), M.F.R. Pereira, A.M.T. Silva

Circular Business Model based on biofuels production from organic waste
Authors: Magdalena Muradin\(^1\), P. Harazin, J. Kulczycka, R. Verhe, G. de Clercq

\(^1\)TNO, The Netherlands Organization for Applied Scientific Research

\(^1\)University Paris-East, Scientific and Technical Centre for Buildings (CSTB)

\(^2\)ETH Zurich, Chair of Sustainable Construction, IBI

\(^1\)Environmental & Sustainability Professional – Indonesia

\(^1\)RWTH Aachen, Institute of Sustainability in Civil Engineering (INaB)

\(^1\)Universidade do Porto, Laboratory of Separation and Reaction Engineering – Laboratory of Catalysis and Materials (LSRE-LCM)

\(^1\)Mineral and Energy Economy Institute of the Polish Academy of Sciences
Life Cycle Assessment and Circularity Indicators
Authors: Lucia Rigamonti¹, E. Mancini ¹

Challenges to use the harmonized EPDs in the European market
Authors: Carolina Szablewski¹, C. Bolle, N. Adibi ¹

Prospective life cycle assessment of the European cement industry
Authors: Maria Georgiades¹, I. Hussain Shah, R. J. Myers ¹

Design and material based Sustainable Mobility – Copper vs. REE
Authors: Ladji Tikana¹, F. Nuno, T. Jezdinsky, M. Gonzalez ¹

Developing a Circular Economy for the Data Centre industry – how the CEDaCI project contributes to sustainable decision making
Authors: Kristina Kerwin¹, D. Andrews, N. Adibi, B. Whitehead, K. Bience, C. Szablewski, ___ ¹London South Bank University J. Chenadec, M. Ponugubati

Improving the sustainability of existing buildings in Nordic countries through energy system optimization
Authors: Vilppu Eloranta¹, A. Woszczek, A. Grönman ¹

Supporting start-ups and SME with life cycle assessment – network based information and planning for change
Authors: Lars Gunnar Furelid Tellnes¹, M. F. Friedrich, A. Kjøniksen, C. Koch ¹

¹Politecnico di Milano, Department of Civil and Environmental Engineering (DICA)

¹WeLOOP

¹Imperial College London, Department of Civil & Environmental Engineering

¹Copper Alliance, International Copper Association

¹LAB University of Applied Sciences

¹Østfold University College
Poster-Pitches

FRIDAY, 03 SEPTEMBER – PRE-CONFERENCE WEEK

Towards integration of LCA/LCC as a driver for Municipal decision-making in sustainable renovation of existing buildings
Authors: Haitham Abu-Ghaida¹, L. Andersen, S. Wandahl, A. Kamari
¹Aarhus University, Department of Civil and Architectural Engineering

Prospective life-cycle assessment of geothermal district heating and cooling networks
Authors: Astu Sam Pratiwi¹, E. Trutnevyte
¹University of Geneva, Faculty of Science, Institute for Environmental Sciences, Renewable Energy Systems Group

Investigating the integration between life cycle thinking, green chemistry principles and sustainability policies
Authors: Daniela Camana¹, S. Toniolo, A. Manzardo
¹University of Padova, CESQA, Department of Industrial Engineering

LCA and distributive justice – a methodological approach of integration
Author: Nathanael Ko¹
¹University of Stuttgart, Institute for Acoustics and Building Physics, Department Life Cycle Engineering (GaBi)

On Conducting a Life Cycle Assessment of Network Traffic: A Qualitative Analysis of Current Challenges and Possible Solutions
Authors: Tova Billstein¹, A. Björklund, T. Rydberg
¹IVL Swedish Environmental Research Institute

Balances of biogenic carbon accounting within and across lives of polymer product systems: A case study approach towards standardization of LCA and GHG accounting frameworks
Authors: Ananda Sekar¹, A. Menon
¹SABIC Research and Technology

Optimized early-stage life cycle assessment of buildings – Developing a tool enabling early-stage parametric life cycle assessment
Authors: Maria Tjäder¹, H. Wallbaum, A. Hollberg, G. Ingelhag
¹Chalmers University of Technology
Introducing the H2020 project ReCreate “Reusing precast concrete for a circular economy”
Author: Satu Huuhka

Designing of Circular Economy solutions and sustainability of agricultural products with life cycle assessment
Author: Tomasz Nitkiewicz

Sustainability Evaluation of Pyrolysis of Waste Mattresses: A Comparison with Alternative End of Life Treatments
Authors: Rajesh Mehta, M. Golkaram

Life cycle management at Italmatch Chemicals – From centralized to decentralized urban mining for a game change in the phosphorus industry
Authors: Eleonora Lomazzi, M. Pasi, C. Galeano, M. Iorio, M. Rapf

Advancing in the digitalization of data for a better analysis of electrical and electronic equipment
Authors: Laura Talens Peiró, X. i Durany

Life cycle assessment of silicon metal by aluminothermic reduction
Authors: Elisa Pastor Vallés, Y. Ma, J.B. Pettersen

Parametric Life-Cycle Assessment and multi-objective design optimization
Authors: Vasileios Kalfountzos, P. Pasanen

Introductory analysis for conducting Life Cycle Assessment of Brazilian silk yarn
Authors: Olívia Toshie Oiko, S. M. B. D. Barcelos, R. Salvador

1 Tampere University, School of Architecture
1 Częstochowa University of Technology, Department of Business Informatics and Ecosystems
1 TNO, The Netherlands Organization for Applied Scientific Research
1 Italmatch Chemicals SpA
1 Universitat Autònoma de Barcelona, Institut de Ciència i Tecnologia Ambientals (ICTA) SosteniPrA Research Group
1 Norwegian University of Science and Technology (NTNU), Faculty of Engineering, Department of Energy and Process Engineering, Industrial Ecology Programme
1 One Click LCA
1 Universidade Estadual de Maringá (UEM-Brazil)
The Organizing committee is pleased to introduce you to the sponsors of the LCM 2021 and thank the following organizations for this great collaboration and for providing such an invaluable support to LCM 2021!
We create chemistry for a sustainable future – that’s BASF’s purpose. We want to contribute to a world that provides a viable future with enhanced quality of life for everyone. We do so by creating chemistry for our customers and by making the best use of available resources. We achieve long-term business success by creating value added for the environment, society and the economy.

To optimize our contribution to a sustainable future, we measure the overall impact of economic, environmental and social aspects of our business activities with our Value to Society methodology on corporate level and with SEEbalance® (Socio-Eco-Efficiency Analysis) on product or process levels. Setting our business in the context of global cooperation networks, we support the United Nations in the implementation of the UN Sustainable Development Goals (SDGs), and we are committed to the Paris Climate Agreement.

Based on our corporate strategy and the global targets derived from this, we steer the sustainability targets – net zero CO₂ emissions by 2050 and achieve € 22 billion in Accelerator sales by 2025 – as most important key performance indicators. Carbon management bundles our global activities to reduce greenhouse gas emissions. We support these activities with Carbon Footprint assessments of all our products. To identify our Accelerator products and manage our product portfolio, we use the Sustainable Solution Steering method. In addition to these two targets, we have also set ourselves further sustainability targets on responsible procurement, engaged employees, women in leadership positions, occupational health and safety, process safety and water management. We take advantage of business opportunities by offering our customers innovative products and solutions that support their sustainability goals. We ensure that the business units evaluate and take into account relevant sustainability criteria when they develop and implement strategies, research projects and innovation processes.

We want to measure the value proposition of our actions along the entire value chain. We are aware that our business activities have an impact on the environment and society, and so we strive to increase the positive contribution and minimize the negative effects of our business activities.

To achieve this, we need to continually improve our understanding of how our actions impact society and the environment. We already have many years of experience of this from evaluating our products and processes using methods such as Eco-Efficiency Analyses, the SEEbalance®, our Sustainable Solution Steering portfolio analysis, or BASF’s corporate carbon footprint.

BASF also plans to make the individual carbon footprints for around 45,000 sales products available by the end of 2021 with the help of a new, in-house digital solution. PCFs comprise all product-related greenhouse gas emissions that occur until the BASF product leaves the factory gate for the customer: from the purchased raw material to the use of energy in production processes (Scope 1–3). Calculating PCFs creates transparency for our customers and partners, enabling us to develop plans together to reduce CO₂ emissions along the value chain up to the end product.
EXCLUSIVE PARTNER

At PRé, we help companies turn sustainability strategy into action, through our fact-based consulting services, training and software solutions based on life cycle thinking. Organizations reach out to us to measure, improve and communicate their sustainability performance. We also help them develop effective strategies and integrate sustainability in the supply chain, product development or organization. Our software solutions are supported by a team of professional consultants, who can also provide guidance through standard or tailored training sessions.

Our specialty is developing long-term solutions that help our customers create value and drive sustainable change. The result? Insights that can be used for sustainable investments. Our global network ensures that we can help our clients with the right expertise and facilitate large international or multi-client projects. Because sustainable change needs collaboration.

PRé also leverages our expertise to create excellent tools. SimaPro is our flagship product: life cycle assessment software that allows sustainability experts and other stakeholders to gain insights into the environmental performance of products and services, to define hotspots and to make improvements. We are proud that it has become one of the leading professional LCA software packages – used by industries, consultancies, and research institutes in more than 80 countries.
EXCLUSIVE PARTNER

Sphera is the leading provider of Environmental, Social and Governance (ESG) performance and risk management software, data and consulting services with a focus on Environment, Health, Safety & Sustainability (EHS&S), Operational Risk Management and Product Stewardship. For more than 30 years, Sphera has helped companies along their journey toward becoming safer, more sustainable and productive. Through software and consulting services, Sphera’s experts work with organizations of all sizes from around the world in hazardous and nonhazardous industries to help them take the guesswork out of their ESG and risk management.

Sphera acquired thinkstep in September 2019 to vastly expand its sustainability portfolio and capabilities. Sphera provides a unique combination of data, software and consulting services that help companies understand, manage, improve and communicate their sustainability and ESG performance. Sphera’s sustainability experts, software tools and industry-specific databases, help more than 8,000 companies globally and in all sectors address their environmental performance needs. Almost half (45%) of Sphera’s customers are in the Fortune 100, including Chevron, Johnson & Johnson, Siemens and Volkswagen. Our consulting services enable companies to build business value from sustainability, gain new investments and future-proof their business.

In the sustainability space, Sphera works with many public authorities and national and regional governments. For instance, Sphera is one of the leading suppliers of datasets to the International Reference Life Cycle Data System of the European Commission which are used for the Environmental Footprint Initiative. Sphera’s Product Sustainability Software (GaBi) is the leading sustainability solution on the market. It houses the world’s largest life cycle inventory database to help companies make the best sustainability business decisions throughout their products life cycles. Every day, more than 2,500 businesses rely on Sphera’s LCA software and data to quantify, analyze and improve the environmental impacts of their products and services.
Innovative by tradition – Stuttgart inspires

The Stuttgart Ballet, Bosch, Porsche, Joseph Beuys, Stihl, Le Corbusier, Mercedes, Oskar Schlemmer, the Television Tower, the Fantastische Vier – these are just a few of the names that have shaped Stuttgart and continue to define the city today.

**AUTOMOTIVE ENGINEERING ACHIEVEMENTS**

With his groundbreaking invention of the automobile in 1886, Gottlieb Daimler set new standards throughout the world in the field of mobility. Today, these milestones can be seen at the Mercedes-Benz and Porsche Museums. Progressively into the future: With the Stuttgart 21 rail project, one of Europe’s most spectacular infrastructure ventures is evolving in the heart of the city.

**CULTURAL SHOWPIECES**

The Stuttgart Ballet Company looks back on a long tradition and for 60 years has enjoyed world-class status, enthralling audiences evening after evening with its outstanding performances. Masterpieces of art from nearly seven centuries are on show at the Stuttgart Museum of Art and the Stuttgart State Gallery. The Joseph Beuys Room at the State Gallery, which was installed by the artist himself, is still just as he designed it and is included in a special exhibition commemorating the artist’s 100th birthday. The Weissenhof Estate is an icon of architectural history. Since 2016 the two houses created by Le Corbusier have been a UNESCO World Cultural Heritage site. More recent award-winning architecture can be seen all over the city – for example the extension of the Württemberg State Library, or the new John Cranko ballet school.

**AWARD-WINNING EXCELLENCE**

Stuttgart’s cityscape is defined by its vineyards: the vines stretch right into the centre of town and provide many a delectable glass of wine. Local wines have won many prizes and are the perfect accompaniment to classic regional specialities such as Maultaschen (or filled pasta) or Zwiebelrostbraten (fried steak with onions). Swabian tradition is fostered in the many wine taverns or the temporary „broom taverns“ run by wine growers. But highly-decorated cuisine is also found here.
Stuttgart inspires
Five Reasons to visit Stuttgart

GREEN OASES IN THE CITY
Stuttgart is one of the greenest cities in Germany. The „Green U“ is a green area more than eight kilometres long that stretches from the Palace Gardens in the heart of town through Rosenstein Park and up to Killesberg Hill Park in the north of Stuttgart. Karlshöhe Hill is a popular inner-city destination, not only in the summer months. And visitors to the Chinese Garden find themselves transported to the realm of the Middle Kingdom. This year, the „Wilhelma“ Zoological and Botanical Gardens celebrate their 175th anniversary and enthrall their guests with the unique combination of historical ambience, tropical plants and insights into the animal world.

STUTTGART AN ITS VIEWS
Stuttgart’s topography is unique: the city centre lies in a valley basin, enclosed by green hills and vineyards. Thanks to this special characteristic, there are a great many scenic lookout points – some with catering facilities. They offer magnificent views over Stuttgart’s surroundings and the city centre. Another special feature is the so-called „Stäffele“ – hundreds of steps that were originally built to provide easier access to the vineyards. Today they lead to some of the city’s finest viewpoints, such as Karlshöhe and Eugensplatz.
WINE EXPERIENCE
Stuttgart boasts 420 hectares of vineyards, making it one of the leading wine-producing cities in Germany. The Stuttgart Wine Trail runs through the vineyards and is the perfect way to explore the vineyard scenery on one’s own. By the way, one of the most impressive views over the vine-clad slopes is from the Royal Burial Chapel on the Württemberg. Information on wine-growing history is to be found at the Museum of Viniculture, or on various wine tours. And in late summer and autumn, the region’s vintners present their wines at the numerous local wine festivals.

URBAN CITY WALKS
Some of the most fascinating walks begin right at one’s own front door or hotel. It’s easy to escape the bustle of the city, for example, by following the Panorama Trails: there are four varied routes leading far into the east of Stuttgart, through the Weissenhof Estate and up to the hill called Birkenkopf, while a tour of the airy heights in the south of the city can ideally include a ride on the historically protected funicular railway.

TIME OUT IN THE STUTTGART REGION
The region around Stuttgart has a wealth of idyllic, unspoilt landscapes that are ideal for tours of discovery and day trips. The Swabian Forest has several premium hiking trails – through natural orchards, spectacular gorges and romantic valleys. The „Löwenpfade“ („Lion Trails“), 15 exceptional circular hiking routes, afford breathtaking views along the Alb escarpment. The Rems and Bottwar Valleys are defined by viniculture. The Wein-Lese-Weg is a hiking trail that offers a fascinating combination of wine and literature.
Thank you

The 10th International Conference on Life Cycle Management LCM 2021 was organized by the Fraunhofer Institute for Building Physics IBP, Department Life Cycle Engineering GaBi. The Institute for Acoustics and Building Physics IABP at University of Stuttgart supported the conference organization as academic co-chair and the German Sustainable Building Council DGNB and Festo SE & Co. KG as industrial co-chairs. We would like to express our sincere thanks to all the host staff who supported the organization of the event and made a successful LCM 2021 possible.

We thank very much the exclusive partners and sponsors PRé Sustainability, Sphera Solutions and BASF for their financial support and their contributions to the program. Many thanks also for the ideational support by Ministry of Economic Affairs, Labour and Tourism Baden-Württemberg with patronage of Minister Dr. Nicole Hoffmeister-Kraut.

Special thanks go to our moderators Rebecca Freitag and Dr. Hannes Krieg for guiding us through the conference and for sharing their inspiring passion for a sustainable future with us. Many thanks also to the motivating keynote speakers Dr. Auma Obama, Dr. Janin Schaffer, Prof. Dr. Dirk Messner and Hannah Helmke, who are helping to save the world and gave us further insights into their work and their impressive engagement.

Also many thanks to all session chairs and reviewers for thoroughly reviewing abstracts and leading the parallel sessions.

Thank you to all the session proposal and abstract submitters, as well as the oral and poster presenters for sharing their knowledge, experiences, results, and solutions with the participants. You are the power of the LCM.

We are very grateful to the organizing team and all the people who supported the successful realization of LCM 2021, starting a few years ago with our application and ending with the final implementation in 2021.

Last but not least, we would like to thank the members of the LCM Conference Planning Committee and in particular Prof. Dr. Matthias Finkbeiner (chair of the Committee) and all the partners from previous LCM conferences for sharing their knowledge and experience with us – and especially thanks to Dr. Allan Astrup Jensen for inventing the LCM conference series and supporting it throughout the years.
Contact

CHAIR OF THE CONFERENCE

Matthias Fischer
Fraunhofer Institute for Building Physics IBP
Head of Department Life Cycle Engineering
matthias.fischer@ibp.fraunhofer.de

ACADEMIC CO-CHAIR OF THE CONFERENCE

Prof. Dr. Philip Leistner
University of Stuttgart
Director Institute for Acoustics and Building Physics (IABP)
philip.leistner@iabp.uni-stuttgart.de

INDUSTRIAL CO-CHAIRS OF THE CONFERENCE

Rainer Seifert
Festo SE & Co. KG
Head of Corporate Responsibility
rainer.seifert@festo.com

Johannes Kreißig
German Sustainable Building Council (DGNB)
Chief Executive Officer DGNB
j.kreissig@dgnb.de
Exclusive Partners of LCM 2021

Image credits:
© Stuttgart Marketing GmbH,
Martina Denker