CIRP LCE 2026 Program

P1: Plenary Session 1

March 11 (Wed.) **Room A・B・C・D 09:30-10:10**

P1-1 Building a Circular Economy through Polymer Innovation: Technical Achievements and System Integration in Japan
Kohzo Ito

A1: Circular Economy

March 11 (Wed.) **Room A 10:30-12:30**

A1-1 Integrated Framework for Quantifying the Economic and Ecological Impacts of Circular Business Model Innovation
Marcel Fischer, Stefan Sailer, Dietmar Grimm, Joachim Metternich

A1-2 Multidimensional Circularity Assessment of Product-Service Systems
Max Werrel, Marcel Wagner, Jan C. Aurich

A1-3 Identification of Social Key Performance Indicators for the Digital Product Passport for Products with Neodymium Magnets
Jennifer Fuchs, Viola Gallina, Sebastian Schlund

A1-4 Artificial Intelligence and Circular Economy: An Exploration of the Ecological Infosphere
Christiane Plociennik, René H. Reich, Adrien Berthelot, Martin Ruskowski, Karel Van Acker, Daniel Schien

A1-5 Configurable Agile Digital Product Passports for Circular Businesses
Wouter Sterkens, Hao Qin, Dillam Jossue Díaz-Romero, Jef R. Peeters

A1-6 Scenario-Based Circular Ecosystem Design: A Case Study of Industrial Automation in Japan
Nagi Sato, Hiroyuki Sekiguchi, Akira Tanabe, Shunji Yamada, Yusuke Kishita

A2: Circular Economy

March 11 (Wed.) **Room A 13:50-15:50**

A2-1 Extending the Business Model Canvas for Circular Business Models
Enno Lang, Michael Spindler, Marcel Fischer, Arne Buchwald, Joachim Metternich

A2-2 A Regional Circular Production System for Reusable Wall Panels in the Norwegian Wood Industry
Qiaowen Zhai, Carla Susana A. Assuad, Tomomi Kito, Shinichi Fukushige

A2-3 Reuse of Lithium-Ion Batteries from Used Forklift Trucks – A Study Identifying the Possibilities of Reuse and Potential Applications of Used Lithium-Ion Batteries and Contributing to a More Circular Economy
Emma Magnusson, Linnea Ranstad, Mattias Lindahl, Erik Sundin

A2-4 Exploring the Consumer Acceptance of Circular Business Models using LLM-Based Simulation
Yudai Tsurusaki, Koji Kimita

A2-5 Reshaping the Electric and Electronic Equipment Sector Towards a Circular Economy: The PiCo2RAEE Platform
Marco Marconi, Giorgia Pietroni, Eleonora Fiore, Alberto Rogato, Claudio Favi

A2-6 The Next Neighbor Problem of the Circular Economy – A Life Cycle Theoretic Perspective on Occurrence and Mitigation Strategies
Robert Miehe, Thomas Mueller-Kirschbaum

A3: Circular Economy

March 11 (Wed.) **Room A 16:10-18:10**

A3-1 Retrofit as a Module Driver: Enabling Circular and Service-Oriented Vehicle Architectures
Bastian Nolte, Pascal Inselmann, Umut Volkan Kizgin, Sven Wehrend, Jana Wendt, Katharina Zumach, Dirk Clasen, Michael Thomas, Dieter Krause, Thomas Vietor

A3-2 Design and Evaluation of Circular Economy Business for Elevators Based on Scenario Analysis
Shunji Yamada, Shintaro Okada, Shoko Kinumaki, Wataru Fushimi, Nagi Sato, Yusuke Kishita

A3-3 Exploring Circular Business Model Implementation and Performance in Remanufacturing Services: A Case Study from the Metalworking Industry
Mohamed Elnourani, Anna Öhrwall Rönnbäck

A3-4 Identifying Cost Drivers in Circular Business Model Planning: Insights from an Explorative Interview Study
Anja Rasor, Lisa Petzke, Christian Koldewey, Roman Dumitrescu

A3-5 Organizational Capabilities for Implementing R-Strategies in Circular Value Networks
Lisa Petzke, Julia Marie Vehmeyer, Anja Rasor, Chistian Koldewey, Roman Dumitrescu

A3-6 Why Let Them Go? Understanding Characteristics of Cast-Off Clothing through Wardrobe Decluttering and Their Circularity Potential
Eri Amasawa, Jun Nakatani, Claudia E. Henninger, Taylor Brydges

B1: Sustainable Manufacturing

March 11 (Wed.) **Room B 10:30-12:30**

B1-1 Activating Industrial Energy Flexibility in Production Planning: A Systematic Pre-Evaluation for Digital Twin-Based Optimization
Julian Perwitz, Thomas Sobottka, Fazel Ansari

B1-2 Automation Readiness Index for Disassembly of Electronic Devices
Michaela Hlatky, Sebastian Schötz, Ronald Schmidt-Vollus

B1-3 Machine Learning Based Automated Industrial-Grade Hospital Waste Segregation Cyber-Physical System for Sustainable Healthcare
Aman Reddy Jukonti , Gajjelli Srimaan , Dev Kunwar Singh Chauhan, Rishi Kumar

B1-4 Data Lakehouses for Enabling Digital Product Passport Orchestration
Katharina Berger, Fredrik Hellman, Andreas Lundell, Jerker Björkqvist, Rupert J. Baumgartner

B1-5 Designing a System Architecture for Automated Product Carbon Footprint Calculation in Production Lines
Steffen Wurm, Adrian Kasner, Oliver Petrovic, Werner Herfs

B1-6 Rehearsal-Based Continual Learning for Very Short-Term Load Forecasting: A Case Study on Parts Cleaning and Drying
Robin Zink, Matthias Weigold

B2: Sustainable Manufacturing

March 11 (Wed.) **Room B 13:50-15:50**

B2-1 Digital Twins for Decentralized Infrared Heating Systems in the Industrial Metaverse
Boris Brandherm, Thomas Schmeyer, Gerhard Sonnenberg, Margarita Chikobava, Andreas Luxenburger, Alassane Ndiaye, Sönke Knoch, Jens Findeisen, Steffen Manser

B2-2 Cognitive AI Agents in Life Cycle Management of Industry 5.0 Organizations: A Conceptual Framework
Lennart Kuhr, Mark Mennenga, Christoph Herrmann

B2-3 Multimodal Modeling of Help-Seeking Intentions in Self-Service Kiosk Interactions toward Just-In-Time Assistance
Zhiyuan Li, Yixuan Zhen, Tatsunori Hara, Yusheng Wang, Jun Ota

B2-4 Context-Aware Manufacturing Execution Systems Planning for Turbulent Manufacturing Situations
Günter Bitsch, Dominik Lucke, Anja Braun

B2-5 Design Principles and Process Model for Planning Data Analytics in Product Management
Khoren Grigoryan, Eliana Bauer, Timm Fichtler, Laban Asmar, Arno Kühn, Roman Dumitrescu

B2-6 Thermal Effects of CO_2 Snow Jet Cleaning on PCB Functionality and its Role in Sustainable Electronics Refurbishment
Eckart Uhlmann, Julian Polte, Tobias Neuwald, Philipp Burgdorf

B3: Sustainable Manufacturing

March 11 (Wed.) **Room B 16:10-18:10**

B3-1 Soft Sensor for Energy Efficient Parts Drying Based on Grey-Box Modeling
Jonathan Magin, Ghada Elserafi, Matthias Weigold

B3-2 Circular Data: A Hybrid Intelligence Framework for Data-Driven Disassembly and Repair in the Circular Economy
Doris Aschenbrenner, Nadine Yilmaz, Anna Geliev, Nicole Stricker, Alexander Redlich, Kathleen Diener

B3-3 Design and Implementation of a Data Space Application Architecture for Sovereign Engineering Collaboration
Martin Schellander, Bernd Hader, Somin Jeon, Lukas Leitner, Zahra Safari Dehnavi, Rudolf Pichler, Michael Heiss, Franz Haas, Sebastian Schlund

B3-4 Digital Thread Complexity and Key Requirements for Circularity
Alex Kim Nordholm, Tomohiko Sakao

B3-5 A Fine-Grained Carbon Emission Accounting Framework for Manufacturing Systems through Model and Data Integration
Weipeng Liu, Zhihui Wang, Pai Zheng, Tao Peng, Liming Wang, Fangyi Li

B3-6 Metadata Model for Engineering of Sustainable Products in Value Creation Networks
Iris Graessler, Sven Rarbach, Jens Pottebaum, Florian Luessen, Joerg Hoffmann

C1: LCA

March 11 (Wed.) **Room C 10:30-12:30**

C1-1 Tiny House and Material Selection Based on Life Cycle Assessment as a Sustainable Alternative to Enhance Disaster Resilience in the Southwestern U.S.
Camila Catherine de Morais Cassundé, Neha Shakelly, John W. Sutherland

C1-2 Environmental Assessment of Ethane and Associated NGL Products from Diverse Sources: A Process-Based Life Cycle Approach
Carolin Meier, Sebastian Rehfeldt, Harald Klein

C1-3 Life Cycle Assessment of CNC Machining for Freeform Mirrors
Hanif Auwal Ibrahim, Noel Harrison, Tomás Flanagan, Aaron Jennings, Stephen Mundy, George Willis, Sinéad Mitchell

C1-4 Environmental Impact Evaluation of Recycling Ti6Al4V Machining Chips via Combined Sintering and Forging
Pooya Hosseini, Eliot Daisomont, Maxime Abreu Marques, Joost R. Duflou

C1-5 Utilization of Whole Algae Cells as a Lubricant Component: Life Cycle Assessment of Novel Bio-Based Fluids for Sheet Metal Forming
Oliver Schömig, Robar Arafat, Steffen Blömeke, Gabriela Ventura Silva, Christoph Herrmann

C1-6 Predicting the Carbon Footprint of Laser Powder Bed Fusion: A Comparative Commercial Vehicle Case Study
Matthias Duve, Kristian König, Tobias Häfele, Nicolas Scherer, Frieder Heieck

C2: LCA

March 11 (Wed.) **Room C 13:50-15:50**

C2-1 Life Cycle Assessment of Polypropylene from WEEE: Utilizing the Circular Footprint Formula for Environmental Evaluation
Theresa Aigner, Anniina Koeppen, Eduard Wagner

C2-2 Life Cycle Engineering Approach Towards Enhancing the Sustainability of Porcelain Products: Comparison between Porcelain and Bone China Manufacturing Processes
Madhurika Geethani, Asela K. Kulatunga, Subodha Dharmapriya

C2-3 Expanding the Scope: Evaluation of High-Priority Circular Strategies for the Treatment of Conveyor Belts
Nicolás Labra Cataldo, Michael Shaver, Laurence Stamford , Craig Spencer-Smith, David Waite, Alejandro Gallego-Schmid

C2-4 Red Gold Production with Microbial Fermentation: an Environmental Assessment
Ana Pinzon, Yannick Baumgarten, Antonin Lenzen, Lucy Skifteri, Jennifer Kendler, Edgar Gamero, Robert Miehe

C2-5 Life Cycle Assessment of the Environmental Load Induced by Different Materials of Drinking Water Pipes
Jumana Al-Mallahi, Kazuei Ishii, Toshiyuki Miyazaki, Takayuki Ogawa, Akiko Tanaka

C2-6 Assessing the Environmental and Economic Potential of Remanufactured and Refurbished Engines in Countries without Domestic OEM Facilities: A Case Study from Indonesia
Tatbita Titin Suhariyanto, Mikha Haganta Meliala, Maria Anityasari, Joko Lianto Buliali, Dzuraidah Abd Wahab

C3: LCA

March 11 (Wed.) **Room C 16:10-18:10**

C3-1 Prospective Life Cycle Inventory Data of Hydrogen Production for Aviation
Niklas Engberg, Antonia Rahn, Benjamin Sprecher

C3-2 Building Sustainable Structures: A Comparative Life Cycle and Carbon Sequestration Assessment of Reinforced Concrete and Engineered Bamboo Beams
Divyansh Paliwal, Kailash Choudhary, Sanjeeb Kakoty, Jose Arturo Garza-Reyes

C3-3 Evaluation of Solid-State Recycling Processes for Aluminum Chips by Microstructure-Based Performance and Screening-Level Life Cycle Assessment
Alexander Koch, Frank Walther

C3-4 Life Cycle Assessment of Vanadium Redox Flow Batteries: Effects of Efficiency, Lifetime and Electricity Source in the Use Phase
Lisa Trautmann, Erik Alexander Recklies, Jonathan Voigt, Emmanuel Effah, Semih Severengiz

C3-5 Life Cycle Assessment of Cotton Waste Recycling – A Systematic Review
Hao Hsiang Hsu, Eri Amasawa

C3-6 Embedding Life Cycle Thinking in a National Research Facility: Environmental Sustainability Analysis of Electron Paramagnetic Resonance Infrastructure
Jingyi Li, Adam Brookfield, Elizabeth Fleming, Christina Picken, David Collison, Eric J.L.McInnes, Alejandro Gallego-Schmid

D1: Advanced Recycling and Recovery Technologies

March 11 (Wed.) **Room D 10:30-12:30**

D1-1 Transforming E-Waste into Strategic Resources: Techno-Economic Analysis of Gallium and By-Products Recovery from LEDs via Bioleaching
Xiaohan Wu, Venkat Roy, Yiming Liu, Neha Shakelly, Tapajyoti Ghosh, Xinbo Yang, John W. Sutherland, Fu Zhao

D1-2 Recycling Carbon Fibre Fabrics from Composite Wastes: A Case Study on End-of-Life Bicycle Components
Di He, Celine Ren, Matthew Doolan

D1-3 Comprehensive Analysis of Techniques for Removing Spot Welded Nickel Strips from Lithium-Ion Battery Cells
Tom Machiels, Bart Engelen, Jos Symons, Karel Kellens

D1-4 Rethinking Platinum Group Metals (PGMs) Recovery Pathways: A Comparative Life Cycle Assessment
Jingyi Li, Christopher Egan-Morriss, Patrick Harvey, Jonathan R. Lloyd, Alejandro Gallego-Schmid

D1-5 Systematic Optimization of the Induction Based Thermal Demagnetization Process for Rare Earth Magnet Recovery from PM Rotors
Roman Hahn, Thorsten Ihne, Marcel Baader, Jörg Franke, Florian Risch

D1-6 Mechanical Recycling of PET and PA Blended Textiles with Elastane: Process Optimization in Pretreatment by Improving Pellet Quality with Variable Binding Agents on a Laboratory Scale
Sahra Pogrzeba, Julian Joachim, Madina Shamsuyeva, Hans Josef Endres

D2: Disassembly

March 11 (Wed.) **Room D 13:50-15:50**

D2-1 Structured Documentation and Evaluation of Manual Disassembly: A Cross-Platform Application for Assessing Recovery Pathways and Automation Potential
Anwar Al Assadi, Vincent Strohkendl, Lasse Höltge, Werner Kraus, Jef R. Peeters, Alexander Sauer

D2-2 Toward Circularity-Driven Product Design Across Varying Disassembly Automation Levels
Lucas Janisch, Manuel Eber, Maximilan Niggl, Terrin Pulikottil, Núria Boix Rodríguez, Caroline Cassignol, Jef R. Peeters

D2-3 Towards Automated Disassembly for Battery Removal of Robot Vacuum Cleaners
Dheeraj Singh, Lasse Hoïtge, Anwar Al Assadi, Daniel Bargmann, Werner Kraus, Marco F. Huber

D2-4 Disassembly and Circularity Assessment of Power Electronic Converters
Irati Ruíz de Azúa, Aitor Picatoste, Daniel Justel, Joan Manuel F. Mendoza

D2-5 A Regret-Based Scheduling Framework for Human-Robot Cooperative Demanufacturing Systems
Sander Teck, Pieter Vansteenwegen, Giovanni Lugaresi, Jef R. Peeters

D2-6 A Priority-Rule-Based Approach for the Dynamic Control of Reassembly in Matrix-Remanufacturing Systems
Finn Bail, Lukas Dierolf, Jens Becker, Martin Benfer, Nicole Stricker, Gisela Lanza

D3: Disassembly

March 11 (Wed.) **Room D 16:10-18:10**

D3-1 Scalable Modeling of Destructive and Non-Destructive Disassembly with Extended Petri Nets for Disassembly Process Planning
Finn-Augustin Brunnenkant, Lasse Streibel, Kelly Tana, Christina Reuter, Michael F. Zaeh

D3-2 Screw Localization Accuracy in CT-Based Predictions for De-Manufacturing
Niels Griffioen, Anthonie Coopman, Wouter Sterkens, Jef R. Peeters, Wim Dewulf

D3-3 Engineering Design for Disassembly: Test of a Time-Based Methodology and the LeanDfD Software Tool
Emeka Igwe, Claudio Favi, Marco Marconi, Marco Mandolini, Anoop Desai

D3-4 Evolution of the Disassembly Map Towards a Standardized and Software-Readable Format for Virtual Product Disassembly
Rachele Rizzioli, Eleonora Fiore, Giorgia Pietroni, Marco Marconi, Claudio Favi

D3-5 Projection-Based Augmented Reality to Support Human Intervention in Robotic Disassembly: A Case Study for Bike Batteries
Willem Mahy, Dorothy Gors, Bart Van Doninck, Hao Quin, Jef R. Peeters

D3-6 Gentle Loosening for Non-Destructive Disassembly of Operationally Seized Threaded Fasteners
Richard Blümel, Lars Aschermann, Annika Raatz

P2: Plenary Session 2

March 12 (Thu.) **Room A・B・C・D 08:50-10:10**

P2-1 "Circular Economy Innovation" for Maximizing the Life Cycle Value of Resources
Shin-ichi Taniguchi, Younjeong Hong, Hiroki Nakatsuchi

A4: Circular Economy

March 12 (Thu.) **Room A 10:30-12:30**

A4-1 The Fellowship of the Circle: Barriers to Establishing Partnerships for Circular Value Creation
Julia Marie Vehmeyer, Lisa Petzke, Christian Koldewey, Roman Dumitrescu

A4-2 Unlocking Circularity Potentials from LMT Batteries: A Material Flow Analysis and Scenario Forecast on Secondary Raw Materials for Europe
Franziska Maisel, Max Tippner, Kibria Mainuddin

A4-3 Material Flow Analysis of End-of-Life Vehicles in Kuala Lumpur and the Role of Authorized Automotive Treatment Facilities
Yuna Seo, Shotaro Onoe, Yuito Tohara, Taiyo Nakao

A4-4 A Planning Support System for Non-Experts in Woody Biomass Combined Heat and Power Business
Yuta Yamaguchi, Yusuke Kishita, Noriaki Nakatsuka, Fumiteru Akamatsu, Takashi Yanagida

A4-5 Bridging the Repair Gap: Evaluating Two Scalable Adaptations of the Repair Café Model
Alex Bunodiere, Joost R. Duflou

A4-6 Repair or Replace? A Market-Based Analysis of Household Appliance Repair Viability in France and Belgium
Alex Bunodiere, Joost R. Duflou

A5: Circular Economy

March 12 (Thu.) **Room A 13:50-15:50**

A5-1 Enabling Cost-Optimal Product Adaptation Planning in Product Service-Systems
Tobias Lachnit, Tobias Hirsch, Moritz Hoerger, Michael Martin, Gisela Lanza

A5-2 Optimal Revenue Sharing for Circular Subscription Services in Dual-Channel Supply Chains
Xinmeng Li, Yasushi Kawase, Yudai Tsurusaki, Koji Kimita

A5-3 Novel Method to Increase Transparency for Recycling-Oriented Design Decisions by Statistical Entropy Analysis
Sönke Hansen, Mark Mennenga, Steffen Blömeke, Christoph Herrmann

A5-4 Evaluating Eco-Labels as Life Cycle Engineering Tools for the European Railway Sector
Célia Cannappah, Willem Haanstra, Jan Braaksma

A5-5 Eco-Ideation Process for Environmentally-Driven Research Projects and Road-Mapping in an RTO
Élise Monnier, Helmi Ben Rejeb, Simon Clavaguera, Peggy Zwolinski

A5-6 Operationalizing EcoDesign: A Comprehensive Review for Integrating Sustainability into Engineering
Jorin Thelemann, Johanna Wurst, Max Leo Wawer, Timo Stauss, Daniel Rosemann, Rayen Hamlaoui, Roland Lachmayer

A6: Industrial session

March 12 (Thu.) **Room A 16:10-18:10**

A6-1 Development of a Product Information–Driven Autonomous Disassembly Robot toward a Circular Economy
Gaku Miyake

A6-2 Arteriovenous Fusion in Manufacturing: Establishing the BlueRebirth Value Chain for Resource Circulation through Precise Dismantling System
Masaomi Dobashi

A6-3 Contribution to Circular Economy by Advanced Home Appliance Recycling
Katsumi Fujisaki, Etsuko Hirose, Yasuto Iseki

A6-4 Development of CMP (Platform for Information on Chemical Substances in Products and Resource Recycling) and Recycling Management Information Platform (RMP)
Kiyoto Furuta

A6-5 Recycling of casting parts in machine tools
Kotaro Mori

B4: Sustainable Manufacturing

March 12 (Thu.) **Room B 10:30-12:30**

B4-1 Enabling Product Life Cycle Assessments in the Manufacturing Industry through Practical Methods in the Collection of Production Data
Merlin Pohler, Hans-Josef Endres

B4-2 Towards Data-Driven End-of-Life Management: Identifying Data Requirements and Availabilities in the Wind Energy Sector
Stefanie Eisl, Janine Mügge, Sascha Thöny, Kathrin Kramer, Joanna Steiner, Theresa Riedelsheimer, Kai Lindow, Sebastian Schlund

B4-3 Harmonizing Product Carbon Footprint Methodologies for a Digital Platform: Comparative Analysis and Recommendations for Guideline Development in the Railway Industry
Sebastian Weise, Johanna Holsten, Steffen Blömeke, Christoph Herrmann

B4-4 A Conceptualized Digital Twin Framework for Energy-Efficient Control in Stochastic Manufacturing using Deep Reinforcement Learning
Mohammad Mehdi Keramati Feyz Abadi, Chao Liu, Marvin Carl May, Ali Keramati, Yuchun Xu, Tony Clark

B4-5 Data Management: Science and Industry in Harmony? Challenges of Data Consistency in Both Domains
Max Leo Wawer, Christopher Gregg, Johanna Wurst, Roland Lachmayer, Matthias Gatzen

B4-6 Dry Ice Micro Pellet Blasting for Sustainable Cleaning of Tungsten Carbide Cutting Tools before PVD Coating
Waldemar Reder, Eckart Uhlmann

B5: Sustainable Manufacturing

March 12 (Thu.) **Room B 13:50-15:50**

B5-1 The Role of Surface Coatings in Recyclability of Plastic Products
Mareike Tilenda, Denise Püllmann, Michael Thomas, Max Ehleben, Max Juraschek

B5-2 Few-Shot-Learning-Based Sequence-to-Point Convolution Neural Network for Energy Data Disaggregation in Industrial Non-Intrusive Loading Monitoring
Pengfei Du, Hans Christian Golong, Weijia Fu, Yee Shee Tan, Huey Yuen Ng

B5-3 Two Visions - One Mission: Uniting the Frameworks of Positive Impact Products & Positive Impact Factories
Simon Mörsdorf, Mark Mennenga, Steffen Blömeke, Gabriela Ventura Silva, Michael Vielhaber, Christoph Herrmann

B5-4 Technical Suitability Assessment of Manufacturing System Components for Hydrogen-Based High-Temperature Processes
Markus Woerle, Svenja Schrader, Jan Geier, Daniel Schneider, Christina Reuter, Michael F. Zaeh

B5-5 Data-Driven Peak Load Analysis for Flexible Energy Management in Industrial Manufacturing: A Case Study at a Heavy Vehicle Production Site
Thomas Schmitt, Fouad El Gohary

B5-6 Optimizing Disassembly Line Balancing with Consideration of Disassembly Depth and Uncertainties
Maik Nübel, Carl-Philipp Immanuel Oltmanns, Matthias Schmidt

B6: Sustainable Manufacturing

March 12 (Thu.) **Room B 16:10-18:10**

B6-1 Does Resilience Equate to Sustainability: Analyzing the Impacts of Machine Disruptions on an SMT Production Line
Amira Bushagour, Juan Gonzalo Sepulveda Astudillo, Adrián Borbolla Muñoz, Rami Mansour, Devarajan Ramanujan

B6-2 Towards Sustainable Laser-Based Manufacturing: A Physics-Informed Machine Learning Approach to Keyhole Welding
Samuele Piandoro, Zha Dexiang, Erica Liverani, Alessandro Ascari, Alessandro Fortunato

B6-3 An Integrative Approach for Implementing Needs-Based Process Operation in Parts Drying to Increase Resource Efficiency
Ghada Elserafi, Jonathan Magin, Matthias Weigold

B6-4 Multi-Objective Anomaly-Driven Reinforcement Learning for Sustainable in-situ Process Optimization in Directed Energy Deposition
Maik Schürmann, André Catrein, Saurabh Varshneya, Marcel Wagner, Jacques Platz, Marius Kloft, Jan C. Aurich

B6-5 Time-Series Modelling for Energy Consumption Prediction in CNC Milling with Regenerative Drives
Anna-Maria Schmitt, Eddi Miller, Fabian Scheller, Jan Schmitt

B6-6 Energy Consumption Forecasting Method for Sustainable Process Planning in End Milling Operations
Masaki Nakamura, Kazuki Shimomoto, Haruhiko Suwa

C4: LCA

March 12 (Thu.) **Room C 10:30-12:30**

C4-1 Life Cycle Assessment of Pyrolysis Valorisation for End-of-Life Medium- Density Fibreboard
Jiabao Wang, Benoit Belleville, Wen Li

C4-2 Uncertainty-Aware Ecodesign: Integration of Fuzzy-Logic into Life Cycle Assessment to Improve Sustainable Product Development
Amélie Pötzke, Steffen Blömeke, Christoph Herrmann

C4-3 Life Cycle Assessment of Biosensor for Virus Production: A Case Study in Sustainable Design of Biointelligent Products
Edgar Gamero, Jennifer Kendler, Yannick Baumgarten, Robert Miehe, Thomas Bauernhansl

C4-4 Hotspot Analysis of a Circular Saw Blade for Cutting Nickel-Based Alloys
Maximilian Voigt, Florian Schreiner, Frank Döpper

C4-5 Assessing Greenhouse Gas Reduction Potential through Eco-Design of Elevators with Consideration of Regional Characteristics
Satoshi Ihara, Takashi Abe, Akihiro Yamaguchi

C4-6 Environmental Impacts of Lithium-Ion Batteries Refurbishment for Second-Life Applications: A Systematic Literature Review
Amos Wei Lun Lee, Yee Shee Tan, Zi Jian Lee

C5: LCA

March 12 (Thu.) **Room C 13:50-15:50**

C5-1 Sustainable Solutions for E-Waste Management: A Comparative Life Cycle Assessment of Traditional and Smart Collection Systems
Pooya Hosseini, Emiliano Tolusso, Federica Sala, Brent Hendrickx, Joost R. Duflou

C5-2 Case Study on Forecasting Scope 3 Category 1 GHG Emissions in Inverter Manufacturing using Dynamic Electricity Mix Scenarios
Kan Kobayashi, Keisuke Tanabe, Shinji Yonemoto, Akihiro Yamaguchi

C5-3 Extending the Life Cycle Assessment Framework: From Impact to Dependency Perspective
Lance Hongwei Huang, Ting Yi Liu, Chia-Wen Li, Mei Hua Yuan, Allen H. Hu

C5-4 A Checklist-Based Tool for Evaluating the Reporting Quality of Discrete Event Simulation Models in Manufacturing Life Cycle Assessments
Adrián Borbolla, Amira Bushagour, Charles Møller, Devarajan Ramanujan

C5-5 Towards Robust Life Cycle Assessments: Adapting the Pedigree Matrix for Time Series Data
Johannes Mayer, Gonsalves Grünert, Alexander Frigge, Philipp Niemietz, Thomas Bergs

C5-6 From Data to Impact: Automating Product Carbon Footprint Assessment through Integrated AI-ERP-LCA Systems
Daniele Landi, Christian Spreafico, Davide Russo

C6: LCA

March 12 (Thu.) **Room C 16:10-18:10**

C6-1 Enhanced Benchmarking Framework for Foundation Industries
Ziyad Sherif, Shoaib Sarfraz, Mark Jolly, Konstantinos Salonitis

C6-2 Methodology for Service-Based Scope 3 Emission Factor Development: A Case Study of Security Services in Singapore
Germaine Tan Li Xuan, Nam Jek Kee Cheryl, Clement Tan Beng Kwee, Eugene Kok, Koo Chia Wei, Leow Yong Jie, Edwin Chua Chen Hwee, Jason Tan, Eugene Ho Hong Zhuang, Hu Ching, Daren Tan Zong Loong, Yeo Zhiquan

C6-3 Integrating Critical Raw Materials into Life Cycle Assessment using a New Dynamic Material Assessment Tool
Ole Meyer, Naila Rana Andira, Fernando Andres Penaherrera Vaca, Alexandra Pehlken

C6-4 Toward Clearer Impact Attribution: Endogenizing System Losses and Coupled Inputs in Input-Output Based Material Flow and Impact Analysis
Jiankan Liao, Sidi Deng, Zhuoer Li, Daniel Cooper

C6-5 Data-Driven Decision-Support Tool for Environmental Performance Evaluation: Integrating Automation
Soufiane El Bechari, Ghada Bouillass, Oualid Jouini, Zied Jemai, Robert Heidsieck

C6-6 Decarbonising Industrial Supply Chains: A Strategic Framework for Managing Scope 3 Emissions in Procurement
Sebastian Steinmeier, Chantal Rietdorf, Michael Rentschler, Edgar Gamero

D4: Digital Product Passports for Life Cycle Engineering

March 12 (Thu.) **Room D 10:30-12:30**

D4-1 A Demonstration Workshop for the Use of the DPP for SMEs
Timo Köring, Detlef Gerhard

D4-2 Enabling the Concept of an Integrated Product Data Model for Life Cycle Engineering by Digital Product Passports
Kai Lindow, Joanna Steiner, Marvin Manoury

D4-3 Enhancing Traceability in Sustainable Manufacturing by Linking Digital Product Passports with Digital Process Passports
Ishaan Kaushal, Badrinath Veluri, Devarajan Ramanujan

D4-4 Digital Product Passport as a Digital Twin? Analyzing Conceptual Intersections and Deriving Design Elements
Helena Ebel, Rainer Stark

D4-5 Smart-Circularity Assessment for Digital Product Passports in the Textile- Exporting Countries of the Global South
Pratik Ganesh Dake, Vandana Ahuja

D4-6 A Conceptual Model to Assess the Environmental Impacts of Digital Product Passports
Lyu Zhang, René H. Reich, Adrien Berthelot, Daniel Schien, Magnus Fröhling, Karel Van Acker

D5: Artificial Intelligence for Life Cycle Engineering

March 12 (Thu.) **Room D 13:50-15:50**

D5-1 Enhancing Digital Product Passports for the Circular Economy with Generative AI
Monireh Pourjafarian, Christiane Plociennik, Peter Stein, Nastaran Moarefvand, Martin Ruskowski

D5-2 Development of Ontology Based Knowledge Construction Tool with Large Language Model
Takehisa Nishida, Tomoaki Morioka, Toshiaki Kono

D5-3 Data-Driven Decision Support and Control for Adaptive Circular Production of Plastics by Injection Molding
Aleksandra Naumann, Gabriela Ventura Silva, Christoph Herrmann

D5-4 Case-Based Reasoning and Knowledge Graphs to Support the Pattern-Based Engineering of Resilient and Sustainable Production Networks
Jan Felix Niemeyer, Christopher Dormeier, Mark Mennenga, Christoph Herrmann

D5-5 Knowledge Extraction Method for Failure Identification using Multimodal Generative AI
Takayuki Uchida

D5-6 Automating Life Cycle Inventory Modelling with Large Language Models
Evangelos Kallitsis, Gregory Offer, Jacqueline Edge

A7: Circular Economy

March 13 (Fri.) **Room A 8:30-10:30**

A7-1 Deriving Product-Specific Remanufacturing Design Guidelines Based on Product Information and Life Cycle Scenarios
Junzhe Xu, Yuya Mitake, Mitsutaka Matsumoto, Genichiro Matsuda, Akio Tajima, Shingo Hamada, Naoya Miyaji, Yasushi Umeda

A7-2 A Framework for Enhanced Circular Product Development with Total Life Cycle Considerations
Gisele Bortolaz Guedes, Fazleena Badurdeen, I.S. Jawahir

A7-3 Advancing Sustainable Production Process Planning for Material Extrusion Processes
Jan Oliver Osterod, Philipp Aust, Adrian Reuther, Benjamin Schleich

A7-4 Advancing Circular Economy with Additively Manufactured Heat Exchanging Structures for Electric Propulsion Cooling
Akilan Mathiazhagan, George Vegini, Majid Asli, Klaus Höschler

A7-5 Early-Design for Circularity in Electrical and Electronic Equipment: a Review of Gaps and Opportunities in Creative Early Design Methods
José Hidalgo-Crespo, Tristan Briard, Camille Jean, Frederic Segonds, Fabrice Mantelet

A7-6 Integrating MaaS and Ex-Ante LCA for Smart and Sustainable Production
Francesco Caraceni, Massimilano Mariani, Matteo Cordara, Andrea Margheri, Carlo Brondi, Andrea Ballarino

A8: Maintenance

March 13 (Fri.) **Room A 11:10-12:30**

A8-1 Maintenance Strategy Planning Methods for Product Lifecycle Management
Toshiaki Kono, Takehisa Nishida, Tomoaki Morioka, Tomoaki Hiruta

A8-2 Sustainable Fatigue Characterization of Metals: Hysteresis-Life – a Universal Short-Time Test Method for Resource-Efficient Fatigue Life Assessment
Alexander Koch, Selim Mrzljak, Simon Strodick, Frank Walther

A8-3 Detecting Inconspicuous Anomalies in Manufacturing using Unsupervised Anomaly Detection
Shradha Ghansiyal, Li Yi, Peter M. Simon, Matthias Klar, Jan C. Aurich

A8-4 Predictive Maintenance for Life Cycle Engineering using I4.0 Technologies in MRO Data Systems
Marco Weiss, Florian Raddatz, Gerko Wende

A9: Circular Economy

March 13 (Fri.) **Room A 13:50-15:50**

A9-1 Digital Tools for Steering Sustainable Manufacturing: Insights on LCAC Tool from the E2Comation Project
Matteo Cordara, Francesco Caraceni, Andrea Margheri, Massimiliano Mariani, Carlo Brondi, Andrea Ballarino

A9-2 Lifetime Heterogeneity – Metrics and Framework for Data-Driven Assessment in Early Design Stages
David Inkermann

A9-3 Systematic Selection Process for the Integration of Carbon Capture and Storage Technologies into Product Development
Jakob Freudenberg , Daniele Jung , Jan Oliver Osterod, Benjamin Schleich

A9-4 Integration of MBSE and LCA Methodologies in Early Design Stages
Thomas Schumacher, David Inkermann

A9-5 Development of a Decision Tool for Assessing the Circularity of Electric Traction Motors
Nicolaus Klein, Markus Heim, Hans Philipp Zorn, Florian Kößler, Jürgen Fleischer

A9-6 Stepwise Procedure for Efficient Characterisation of Retired Batteries Towards Second-Life Applications
Niraj Chauhan, Hans Thiery Tjong, Shun Yang, Sebastian Thiede

A10: Circular Economy

March 13 (Fri.) **Room A 16:10-18:10**

A10-1 Into the Unknown: Synthetic Confidence Intervals for Sustainability Trade-Off Analysis in Early Product Development
Fabian R. Rusch, Niels Demke, Frank Mantwill

A10-2 Eco-SCAMPER: A Knowledge-Based Toolkit for Integrating Structured Creativity into Sustainable Design Ideation
Pingfei Jiang, Ji Han

A10-3 Bridging the Gap between Circularity Assessment and Data Governance
Lauren Durivault, Ghada Bouillass, Michael Saidani, Bernard Yannou, Abdelhamid Boujarif, Robert Heidsieck

A10-4 Integrating Sustainability in Early Product Development: A Model-Based Approach Considering Data Quality
Niklas Quernheim, Niklas Ulmer, Daniele Jung, Benjamin Schleich

B7: Sustainable Manufacturing

March 13 (Fri.) **Room B 8:30-10:30**

B7-1 Sustainability Transition of Production Systems: a Longitudinal Study Investigating Regenerative Manufacturing Attributes
Thayse Andreza de Medeiros Costa, Sofia Vitoria Cavalcante de PontesIvan Bolis, Sandra Naomi Morioka

B7-2 Sustainability Objectives in Strategic Asset Management Plans: A Qualitative Analysis
Carithea Richards, Willem Haanstra, Giacomo Barbieri, Jan Braaksma

B7-3 Simulation-Based Prediction of Electrical Load Profile in Machining Processes
Berend Denkena, Klaas Maximilian Heide, Alexander Böttcher

B7-4 Framework for the Design of Sustainable and Resilient Supply Chains with Ai-Based Demand Forecasts
Raphael Ginster, Alexander Barke, Jan Felix Niemeyer, Allan N. Zhang, Shanshan Yang, Zhiquan Yeo, Mark Mennenga, Christoph Herrmann, Thomas S. Spengler

B7-5 Integrated Assessment of Sustainability and Resilience in the Context of Production and Supply Network Analysis
Alexander Barke, Moritz Proff, Jan-Linus Popien, Thomas S. Spengler

B7-6 Evaluating and Comparing the Environmental Performance of Manufacturing Processes Considering Design for Additive Manufacturing: A Case Study Based on Wire Arc Additive Manufacturing and Green Sand Casting
Antoine Balidas, Olivier Kerbrat, Matthieu Rauch

B8: Sustainable Manufacturing

March 13 (Fri.) **Room B 11:10-12:30**

B8-1 Intelligent Utilization of Power Profiles: Energy-Efficient and Sustainable Plastics Injection Molding Processing without Sacrificing Part Quality
Stefan Kerkenberg, Christian Oetjen, Hans-Josef Endres, Carsten Bye

B8-2 Towards Climate-Neutral Factories: Agent-Based Simulation to Decarbonize Factory Systems with Renewable Energy
Christoph Imdahl Habel, Florian Scheffler, Sabrina Zellmer, Michael Gensicke, Christoph Herrmann

B8-3 Take-Back in Supply Chain Management: Trends, Practices, and Future Perspectives
Tiago Bernardino Vargas, Paulo Henrique Amorim Santos, Elias Ribeiro da Silva, Lisa Heldt

B8-4 Navigating Energy Transition Strategies for Companies through a Modular Configurator
Jasper W. Horn, Shun Yang, Tom Geerdinck, Sebastian Thiede

B9: Sustainable Manufacturing

March 13 (Fri.) **Room B 13:50-15:50**

B9-1 Energy- and Productivity-Related Robustness of Matrix Production Systems
Marc Münnich, Steffen Ihlenfeldt, Sebastian Thiede

B9-2 Green Hydrogen for Net-Zero Manufacturing – A Case Study for a Chemical Production Site in Germany
Florian Scheffler, Christoph Imdahl Habel, Sabrina Zellmer, Christoph Herrmann

B9-3 E-Strategies for the Structured Identification of Measures for Improving Energy Performance of Manufacturing Enterprises
Max Juraschek, Nadine Madanchi, Felipe Cerdas

B9-4 Enabling Circular Reverse Logistics: A Digitally Enhanced Decision-Support Framework
Sara Scheffer, Kurt Matyas, Fazel Ansari

B9-5 Simulation Based Configuration Platform for Circular Manufacturing Systems
Jorge Francisco Cabello Oqueña, Shun Yang, Sebastian Thiede

B9-6 Decision-Making under Deep Uncertainty: A Methodology for the Future-Proof Design of Energy Systems
Kilian Dickel, Aniq Ahsan, Sun Yajuan, Gabriel Ventura Silva, Mark Mennenga

B10: Life cycle thinking in product and process innovation

March 13 (Fri.) **Room B 16:10-18:10**

B10-1 A Conceptual Framework for Circular Space Cooling in Buildings
Yue Yu, Nicolas Enrique Labra Cataldo, Obuks Ejohwomu, Alejandro Gallego-Schmid

B10-2 Towards Sustainable Aerial Systems: Cardboard-Based UAVs for the Circular Economy
Mikihiro Kasahara, Katsuya Hasegawa

B10-3 Magnetic Separation of Hard and Soft Magnetic Granulate Mixtures for the Recycling of Neodymium Magnets
Thorsten Ihne, Roman Hahn, Robert Vogel, Marcel Baader, Jörg Franke, Florian Risch

B10-4 Assessing the Influence on the Mechanical Performance of Increased Glass Fiber Length in Wet-Laid Nonwovens to Enhance Recycled Fiber Utilization
Fabian Rechsteiner, Frank Manis, Michael Sauer, Klaus Drechsler

C7: LCA

March 13 (Fri.) **Room C 8:30-10:30**

C7-1 A Tensor-Based Predictive TEA–LCA Framework for Modular Disassembly and Remanufacturing of Clean Energy Magnets
Albin John, John W. Sutherland

C7-2 Life Cycle Assessment of Rack Servers with Circular Strategies
Ritbik Kumar, Yong Han Kim, Chandra Nath, John W Sutherland

C7-3 Multi-Source Heterogeneous Data Fusion and Real-Time Anomaly Monitoring Method for Unmanned Production Lines of Complex Products
Chen Zheng, Chengran Jiang, Qin Wang, Xudong Li, Han Wang, Zhanxi Wang

C7-4 Applying Discrete-Event Modelling to Enable Spatio-Temporal Life Cycle Assessment in the Aviation Sector
Antonia Rahn, Joana Albano, Niklas Engberg, Ahmad Ali Pohya, Gerko Wende

C7-5 Understanding the Limits of Generic LCI Data: Process-Induced Variability in Machining
Gonsalves Grünert, Tobias Kelliger, Rieke A. A. Schulte, Philipp Niemietz, Thomas Bergs

C7-6 Sustainable Low-Carbon Metallurgy in Zimbabwe: A Critical Review on the Potential of using Self-Reducing Pellets for Ironmaking
Shebar Matron Masuka, Marry Chikuruwo, Edson Kugara Chiwandika, Quinton Kanhukamwe

C8: LCA

March 13 (Fri.) **Room C 11:10-12:30**

C8-1 Identification and Prioritization of Key Levers for Sustainable Mold Manufacturing
Wolfgang Boos, Thomas Eberius, Leonhard Klisch, Helen Baumert

C8-2 Climate Change Impact of Pedal Electric-Assisted Bike: The Cases of Barcelona and Munich
Emmanuel Effah, Nora Schelte, Hannes Ehrecke, Jonathan Voigt, Semih Severengiz

C8-3 A Life Cycle Perspective on Monofacial and Bifacial Photovoltaic Module Sustainability and Environmental Offsets
Massimiliano Mariani, Francesco Caraceni, Matteo Cordara, Andrea Margheri, Carlo Brondi, Andrea Ballarino

C8-4 Circular Footprint Formula: Challenges and Opportunities in Assessing the Circularity of Post-Consumer Recycled Materials for Automotive Panels
Vineet Shah, Carsten Asshoff, Nina Ritter, Dirk Berthold

C9: LCA

March 13 (Fri.) **Room C 13:50-15:50**

C9-1 Techno-Economic and Environmental Assessment of Industrial-Scale Fired Ammonia Cracking for Hydrogen Transportation
Sebastian Wodak, Bruno Villela Pedras Lago, Sebastian Rehfeldt, Harald Klein

C9-2 Evaluating Environmentally Weighted Recycling Efficiency of a Technology: Discussion of Methodology and Application on a Case-Study
Andrea Margheri, Matteo Cordara, Francesco Caraceni, Massimiliano Mariani, Carlo Brondi, Andrea Ballarino

C9-3 Sustainability Metrics for the Factory-in-a-Box Paradigm: Informing Early Business Case
Justyna Rybicka, Olatunde Banjo, Yousef Haddad, Leigh Kirkwood, Konstantinos Salonitis

C9-4 LYFE^2: A Lifecycle Analysis Framework for Environment & Economics in Aviation
Jennifer Ramm, Antonia Rahn, Maria Höller, Ahmad Ali Pohya, Gerko Wende

C9-5 Foundations for a Simplified Climate Change Assessment for Manufacturing SMEs in Germany
Maria Celia Briones Espinoza, Tobias Spengler, Matthias Schicktanz, Miguel Gonzalez-Salazar

C9-6 Assessing the Embodied Energy of Energy Facilities: a Life Cycle Approach for the Key Construction Materials Required in Transition Scenarios
Elsa Cohen, Sandra Bouneau, Marc Ernoult, Guillaume Blanc, Peggy Zwolinski, Luc Salvo, Guillaume Roux, Christian Simon

C10: LCA

March 13 (Fri.) **Room C 16:10-18:10**

C10-1 Assessing Material Circularity and Carbon Footprint at Component Level in Electronic Products
Chantal Rietdorf, Ehsan Nemati, Jonas Keller, Amelie Otterbach, Tobias Manuel Prenzel, Manuel Sonnenberg, Robert Miehe

C10-2 Component-Level Circularity Assessment: A Methodological Contribution for CE Decision Making in the Heavy-Duty Vehicle Industry
Carolin Escherich, Henriette Vogel, Johannes Fottner

C10-3 Using AI in Life Cycle Assessment Education: Insights from Higher Education and Guidelines for Responsible Integration
Walid Ijassi, Samuel Quintero-Herrera, Sarra Brahem, Peggy Zwolinski, Claudio Favi

C10-4 Concept for Environmentally Oriented Engineering in Composites Industry Based on LCA
Aljoscha Hieronymus, Kevin Christopher Dorling, Klaus Drechsler

C10-5 Conceptual Data Stream Framework for Scope 3 Hybrid Modelling using a Product Lifecycle Lens
Victoria Omeire, Okechukwu Okorie, Maria Sharmina, Paul T. Mativenga

C10-6 Comparing Large Language Model Methodologies for Life Cycle Inventory Data Extraction
Kira Fischer, Shayan Khakmardan, Nikolas Dilger, Sabrina Zellmer, Wen Li, Christoph Herrmann

D8: System-Level Modelling and Simulation for Life Cycle Engineering

March 13 (Fri.) **Room D 11:10-12:30**

D8-1 Roadmap for Decarbonizing Production in Emission-Intensive Industries: Considering Lean, Digital, Sustainable, and Green Technological Measures
Olivia Bernhard, Felix Marta, Jan Geier, Finn-Augustin Brunnenkant, Christina Reuter

D8-2 A Hybrid Approach Combining Macroscopic Traffic and Life Cycle Simulations to Evaluate Environmental Loads of Regional Transportation Including Ridesharing
Hidenori Murata, Tatsuyuki Yamamoto, Hideki Kobayashi

D8-3 Pattern-Driven Hybrid Simulation of Circular Economy Business Models and Value Chains – A Conceptual Framework
Christopher Dormeier, Oscar Nieto-Cerezo, Joan Manuel F. Mendoza

D8-4 Simulation-Based Decision Support for Circular Spare Parts Management in the Commercial Vehicle Sector: The Case of High-Voltage Batteries
Marius Hermsen, Mark Mennenga, Christoph Herrmann

D9: Absolute Sustainability

March 13 (Fri.) **Room D 13:50-15:50**

D9-1 On Ambidexterity of Leadership and Organizational Design in the Context of Relative and Absolute Sustainability
Robert Miehe, Peter Schrader

D9-2 Aligning Green Certifications with Planetary Boundaries
Sareh Shahrabifarahani, Sami Kara, Michaël Lejeune

D9-3 Absolute Sustainable Product Engineering (ASPE) - A Conceptual Framework for Engineering within Absolute Limits
Kristian König, Michael Vielhaber

D9-4 Safe Operating Space (SOS) Allocation and Uncertainties: An Australian Perspective
Tom Speiser, Michaël Lejeune , Sami Kara, Michael Hauschild

D9-5 Framework for Multi-Dimensional Absolute Environmental Sustainability and Product Criticality Assessment of Emerging Battery Technologies
Siavash Aghaei, Abdur-Rahman Ali, Steffen Blömeke, Christoph Herrmann

D10: Organizational and Societal Dimensions of Life Cycle Engineering

March 13 (Fri.) **Room D 16:10-18:10**

D10-1 Evaluating UK ETS Effects and Life-Cycle Engineering Opportunities for Emissions-Intensive UK Listed Companies
Yogesh Nanda, David Butler, Shoaib Sarfraz

D10-2 Scan Your Trash: Exploring Participatory Data Capture to Enrich Object Detection Datasets for Post-Consumer Plastic Sorting
Natalie Basedow, Nicole Rau, Doris Aschenbrenner

D10-3 Exploring Decision Rationalities of Project Managers Steering Sustainable Development
Isadora Helena Nogueira, Ivan Bolis, Winston Jeronimo Silvestre, Sandra Naomi Morioka

D10-4 A Framework for Equitable Allocation of Internal Carbon Pricing and GHG Emissions to Support Firm-Level and Sectoral Decarbonisation
Daren Z.L. Tan, Jonathan S.C. Low, Aaron E.S. Chia

D10-5 Towards a Reference Architecture Model for the Perpetual Innovative Product
Gabriel Moser, Kristian Vlajic, Fabian Herr, Stefan Eric Schwarz, Manuel Wei Spekker, Tobias Düsera, Albert Albersa