

# CIRP LCE 2026 Program

**March 11 (Wed.)**

**Room A • B • C • D 09:10-09:30**

Circular economy in Japan  
Koji Takahashi

## P1: Plenary lecture 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**

Chair: Joost Duflou

- 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 Diaz-Romero, Jef R. Peeters
- A1-6** 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

## A2: Circular Economy

**March 11 (Wed.)**

**Room A 13:50-15:50**

Chair: Jef R. Peeters

- 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 Fukushima
- 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 Mieke, Thomas Mueller-Kirschbaum

## A3: Circular Economy

**March 11 (Wed.)**

**Room A 16:10-18:10**

Chair: Tim C. McAloone

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

Chair: Wen Li

- 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**

Chair: Sebastian Thiede

- 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<sub>2</sub> 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**

Chair: Paul Mativenga

- 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**

Chair: Claudio Favi

- 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**

Chair: Thomas Stefan Spengler

- 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 Kumudu 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 Antonio 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**

Chair: Max Juraschek

- 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** 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
- 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**

Chair: Erik Sundin

- 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**

Chair: Tomomi Nonaka

- 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 Höltege, Werner Kraus, Jef R. Peeters, Alexander Sauer
- D2-2** Toward Circularity-Driven Product Design Across Varying Disassembly Automation Levels  
Lucas Janisch, Manuel Eber, Maximilian Niggel, Terrin Pulikottil, Núria Boix Rodríguez, Caroline Cassagnol, Jef R. Peeters
- D2-3** Towards Automated Disassembly for Battery Removal of Robot Vacuum Cleaners  
Dheeraj Singh, Lasse Höltege, Anwar Al Assadi, Daniel Bargmann, Werner Kraus, Marco F. Huber
- D2-4** Disassembly and Circularity Assessment of Power Electronic Converters  
Irati Ruiz 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

Chair: HARUHIKO SUWA

- 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 lecture 2

March 12 (Thu.)

Room A • B • C • D 08:50-09:30

- P2-1** Circular Factory for the Perpetual Innovative Product  
Gisela Lanza

## P3: Plenary lecture 3

March 12 (Thu.)

Room A • B • C • D 09:30-10:10

- P3-1** Achieving the Maximization of Resource Lifecycle Value through Circular Economy Innovation  
Shin-ichi Taniguchi, Younjeong Hong, Hiroki Nakatsuchi

## A4: Circular Economy

March 12 (Thu.)

Room A 10:30-12:30

Chair: Christoph Herrmann

- 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** Stepwise Procedure for Efficient Characterisation of Retired Batteries Towards Second-Life Applications  
Niraj Chauhan, Hans Thiery Tjong, Shun Yang, Sebastian Thiede
- A4-5** Repair or Replace? a Market-Based Analysis of Household Appliance Repair Viability in France and Belgium  
Alex Bunodiere, Joost R. Duflou
- A4-6** Bridging the Repair Gap: Evaluating Two Scalable Adaptations of the Repair Café Model  
Alex Bunodiere, Joost R. Duflou

## A5: Circular Economy

March 12 (Thu.)

Room A 13:50-15:50

Chair: Tomohiko Sakao

- 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**

Chair: Yasushi Umeda

- 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**

Chair: Fu Zhao

- 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, 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**

Chair: Steffen Bloemeke

- B5-1** The Role of Surface Coatings in Recyclability of Plastic Products  
Mareike Tilenda, Denise Pullmann, 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**

Chair: Christian Scheller

- B6-1** Does Resilience Equate to Sustainability: Analyzing the Impacts of Machine Disruptions on an SMT Production Line  
Amira Helen 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**

Chair: Alejandro Gallego Schmid

- 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 Mieke, Thomas Bauernhansl
- C4-4** Hotspot Analysis of a Circular Saw Blade for Cutting Nickel-Based Alloys  
Maximilian Voigt, Florian Schreiner, Frank Döpfer
- 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**

Chair: Dev Ramanujan

- C5-1** Sustainable Solutions for E-Waste Management: A Comparative Life Cycle Assessment of Traditional and Smart Collection Systems  
Pooya Hosseini, Emiliano Toluoso, 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 Möller, 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

## **D4: Digital Product Passports for Life Cycle Engineering**

**March 12 (Thu.)**

**Room D 10:30-12:30**

Chair: Tomoaki Hiruta

- 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**

Chair: Koji Kimita

- 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 Thomas 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

## **C6: LCA**

**March 12 (Thu.)**

**Room E 16:10-18:10**

Chair: Daniel Cooper

- 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 Antonio Gamero

## **A7: Circular Economy**

**March 13 (Fri.)**

**Room A 8:30-10:30**

Chair: Peggy ZWOLINSKI

- A7-1** Scenario-Based Circular Ecosystem Design: A Case Study of Industrial Automation in Japan  
Nagi Sato, Hiroyuki Sekiguchi, Akira Tanabe, Shunji Yamada, Yusuke Kishita
- 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, Massimiliano Mariani, Matteo Cordara, Andrea Margheri, Carlo Brondi, Andrea Ballarino

## **A8: Maintenance**

**March 13 (Fri.)**

**Room A 11:10-12:30**

Chair: Shozo Takata

- 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**

Chair: Abhijna Neramballi

- 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** 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

## A10: Circular Economy

March 13 (Fri.)

Room A 16:10-18:10

Chair: Mattias Lindahl

- 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

Chair: John W Sutherland

- B7-1** Sustainability Transition of Production Systems: A Longitudinal Study Investigating Regenerative Manufacturing Attributes  
Thayse Andreza de Medeiros Costa, Sofia Vitoria Cavalcante de Pontes, Ivan Bolis, Ivan 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

Chair: Shinsuke Kondoh

- 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

Chair: Yasushi Umeda

- 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**

Chair: Mark Mennenga

- 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
- B10-5** Evaluation of Solid-State Recycling Processes for Aluminum Chips by Microstructure-Based Performance and Screening-Level Life Cycle Assessment  
Alexander Koch, Frank Walther
- B10-6** From Quarry Waste to Functional Material: Developing and Evaluating Granite-Filled Polymer Pellets for Additive Manufacturing  
Joaquim Justino Netto, Dora Sousa, Gonçalo Cardeal, Pedro Amaral, Marco Leite

## **C7: LCA**

**March 13 (Fri.)**

**Room C 8:30-10:30**

Chair: Yuya Mitake

- 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  
Ritvik 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 Chamunorwa Kanhukamwe

## **C8: LCA**

**March 13 (Fri.)**

**Room C 11:10-12:30**

Chair: Juan Felipe Cerdas Marin

- 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

Chair: Eri Amasawa

- 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<sup>2</sup>: 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** Environmental Impact Assessment of 3D-Printed Tyres Fabricated by Material Extrusion: The Potential of Modular Designs  
Manuel Sardinha, Marco Leite, Tânia R. P. Ramos, Luís Reis, M. Fátima Vaz, Inês Ribeiro

## C10: LCA

March 13 (Fri.)

Room C 16:10-18:10

Chair: Shinichi Fukushima

- 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 Mieke
- C10-2** Component-Level Circularity Assessment: A Methodological Contribution for CE Decision Making in the Heavy-Duty Vehicle Industry  
Carolyn 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 Oluchi 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

Chair: Hideki Kobayashi

- 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  
Hidegori 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 Hermesen, Mark Mennenga, Christoph Herrmann

## D9: Absolute Sustainability

**March 13 (Fri.)**

**Room D 13:50-15:50**

Chair: Michael Z. Hauschild

- D9-1** On Ambidexterity of Leadership and Organizational Design in the Context of Relative and Absolute Sustainability  
Robert Mieke, 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  
Thomas Judah 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
- D9-6** Towards absolute environmental sustainability: product development within the planetary boundaries  
Afonso Gonçalves, Marta Poch, Inês Ribeiro, Elsa Henriques, Gonçalo Cardeal

## D10: Organizational and Societal Dimensions of Life Cycle Engineering

**March 13 (Fri.)**

**Room D 16:10-18:10**

Chair: Hiroyuki Hiraoka

- 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 Düser, Albert Albers