Contents

Session: **G01: Sustainable Products and Processes**  
Chair: Andrew Hopkins (G01)

A Quantitative Analysis System for Greener Wind Turbine Concept Selection  
*Wai Cheung, Raymond Aso*  
1

Assessment of Sustainable Product Development Tools and Methods  
*Salari Meysam, Bhuiyan Nadia*  
13

Kinematic Analysis and Optimization of Bicycle Suspension  
*Jody Muelaner, Tom Knight, Joss Darling*  
29

Investigation of Cutting Parameters in Sustainable Cryogenic End Milling  
*ALBORZ SHOKRANI, Vimal Dhokia, Stephen Newman*  
39

Effect of Glass Surface Roughness on Separation Energy in Low Temperature Ultrasonic Soldering  
*Erry Adesta, M Mustafa, H Mohamad, Irfan Hilmy*  
51

The Assembly and Disassembly Process Guided by Software Agents  
*Leo van Moergestel, Erik Puik, Daniel Telgen, John-Jules Meyer*  
61

Non-parametric benchmarking of Life Cycle Impact Assessment results  
*Sebastián Lozano, Mª Teresa Moreira, Gumersindo Feijoo*  
74

Session: **G02: Sustainable Manufacturing Systems and Enterprises**  
Chair: Daniel Eyers (G02)

Environmental Impact Reduction for Small and Medium-sized Manufacturing Enterprises in New Product Development  
*Wai Cheung, Thomas Woods, Kevin Hilton, Roger Penlington*  
82

Product change management: The through-life impact of diverging designs within product fleets  
*Paul Prickett, Ashley Morris, Rossi Setchi*  
95

Conceptual Model for the Use of ICT Systems to Facilitate Manufacturing SME Servitization  
*Dominic Bevan*  
107

Factory Eco-efficiency Modelling: Framework Development and Testing by Application  
*Aanand Davé, Peter Ball, Konstantinos Salonitis, Craig Astfalck*  
121
Contents

Exploring Connections between Lean and Sustainability? A Systematic Literature Review
Anne Touboulic, Claire Biggs, Helen Walker, Zoe Radnor

Energy Absorbing Characteristics of Additively Manufactured TPE Cellular Structures
Shwe Soe, Michael Ryan, Graham McShane, Peter Theobald

Continuous improvement of the effectiveness of equipment driven by the dynamics of cost reduction
Alin Aurelian Posteucă, Miruna Zapiu

Secondary use of electric vehicle batteries and potential impacts on business models
Na Jiao, Steve Evans

Session: G03: Decision Support Tools for Sustainability
Chair: Ying Liu (G03)

A Strategy Process for Early Stage Ventures to Develop Sustainable Value Opportunities
Nancy Bocken, Padmakshi Rana, Nicky Athanassopoulou, Imoh Ilevbare, Robert Phaal

Eco-Case Based Reasoning (Eco-CBR) for Supporting Sustainable Product Design
Awanis Romli, Miguel P. De La Pisa, Rossitza Setchi, Paul Prickett, Shwe Soe

Sustainability criteria for transport of home care staff and frail people
Jana Voegl, Patrick Hirsch

Competences necessary to improve the ability of organisations to design sustainable futures
Lloyd Fernando, Steve Evans

Developing sustainable manufacturing strategies through practice maturity assessment
Lampros Litos, Steve Evans

Remanufacturing in Pearl River Delta Area China: Challenges and Opportunities
Yong-chao WANG, Ya-Feng ZHU
Contents

Recommendations for Sustainability in Production from a Machine-Tool Manufacture  
*Javier Diaz, Carlos Toro, Iñigo Barandiaran, Jorge Posada*

Session: **IS01: Sustainable Business Models and Value Networks**  
Chair: Nancy Bocken (IS01)

Product design and business model strategies for a circular economy  
*Nancy Bocken, Conny Bakker, Ingrid de Pauw*

Incorporating Designing Thinking into Sustainable Business Modelling  
*Martin Lehmann, Nancy Bocken, Jón Steingrimsson, Steve Evans*

Achieving Sustainability in Small to Medium sized Manufacturing Enterprises through Educational Awareness  
*Michael Packianather, Alan Davies, John White, Sajith Soman*

The Choice of Production Volume of the ELV Depollution Station Using the Decision - Making Analysis  
*Aleksandar Tomovic, Milan Pavlovic, Milan Nikolic, Danijela Tadic, Aleksandar Pavlovic*

Sustainable Business Model Innovation: The Cases of Patagonia Inc. and Bureo Skateboards  
*Fiona Stappmanns*

Session: **IS02: Sustainability of Additive Manufacturing**  
Chair: Martin Baumers (IS02)

Investigation of Influencing Variables on Sustainability of 3D-Printing and Fused Deposition Modelling  
*Stefan Junk, Rebecca Matt*

An Investigation into the Recycling of Ti-6Al-4V Powder Used Within SLM to Improve Sustainability  
*Richard O’Leary, Rossi Setchi, Paul Prickett, Gareth Hankins*

Challenges and Opportunities in the Additive Layer Manufacturing of Al-Al2O3 Nanocomposites  
*Quanquan Han, Rossitza Setchi, Bhushan Karihaloo*

Theoretical Analysis of the Mechanical Response of Lattice Structures Manufactured using Selective Laser Melting  
*Qixiang Feng, Qian Tang, Ying Liu, Rossi Setchi*
Contents

Session: **IS03: Energy efficient manufacturing systems**
Chair: Peter Ball (IS03)

A Methodology for Process and Energy Mapping In Production Operations  
*Maria-Jose Rivas Duarte, John Cosgrove, Frances Hardiman*

Energy Saving Opportunities in a Food Factory  
*Richard Greenough, Pedro Sánchez Fuentes*

Design and Control of Manufacturing Systems for Enabling Energy-efficiency and -Flexibility  
*Tim Stock, Theo Bietz, Denys Alva, Martin Swat, Günther Seliger, Dirk Bähre*

The application of web based LEAN Manufacturing tools to support the implementation of ISO 50001 - A Case Study v1.0  
*Ken Bruton, Peter O'Donovan, Dominic O'Sullivan*

Session: **IS04: Design Verification in the Context of the Light Controlled Factory**
Chair: Paul Maropoulos (IS04)

A hybrid Measurement Systems Analysis and Uncertainty of Measurement Approach for Industrial Measurement in the Light Controlled Factory  
*Jody Muelaner, Andrew Francis, Mark Chappell, Paul Maropoulos*

The Issues & Challenges of 3D Managed Print Services: Towards a Support Tool for 3D Managed Print Services  
*James Gopsill, Ben Hicks*

Tracking Technologies to Support Virtual Prototyping of Manual Composite Lay-Up  
*Ashutosh Tiwari, Edyta Dzikon, Windo Hutabarat, Christopher Turner*

Effect of illumination wavelength on optimizing multicamera location systems in a factory environment  
*Stuart Robson, Lindsay MacDonald, Stephen Kyle, Mark Shortis*

Remote Real-Time Collaboration Platform enabled by the Capture, Digitisation and Transfer of Human-Workpiece Interactions  
*Vinayak Prabhu, John Oyekan, Ashutosh Tiwari, Yohann Advikolanu, Mark Burgess, Rob McNally*

Implementation of a machine tool performance measurement and diagnostic system and its impact on parts verification  
*Akbar Jamshidi, Mark Chappell, Jon Cave, Paul Maropoulos*
Contents

Design for Verification in the Context of the Light Controlled Factory 538  
Paul Maropoulos, Andrew Francis, Jody Muelaner

Computer aided Micro-EDM die-sinking tool design optimization 552  
Samuel Bigot, Anthony Surleraux, Romain Lepert, Jean Phillipe Pernot

Session: **IS05: Knowledge networking via social media for sustainable supply chains**  
Chair: Susan Grant (IS05)

Measuring and linking social network knowledge exchange and organisational performance 572  
Raúl Rodríguez Rodríguez, Josefa Mula Bru, Pedro Gómez-Gasquet, Ramona Diana Leon

Business applications for Virtual World Platforms for Training 584  
Olinkha Gustafson-Pearce, Susan Grant

Pre-requisites to transferring tacit knowledge using social media 596  
Susan Grant, Olinkha Gustafson Pearce

Social Media and Social Networking Analysis for Knowledge Networking 606  
Josefa Mula, Raúl Rodriguez, Pedro Gómez, Susan Grant

Manufacturing Lead-Time Reduction and Knowledge Sharing in the Manufacturing Sector 618  
Twana Jaff, Atanas Ivanov

Session: **IS06: Sustainable Supply Chains**  
Chair: Anthony Soroka (IS06)

Are we really doing the ?right thing?? From sustainability imperialism in global supply chains to an inclusive emerging economy perspective 630  
Anne Touboluc, Ehimen Ejodame

Supply Chain Re-shoring and its Relationship with Supply Chain Resilience 644  
Anthony Soroka

Opportunities for Sustainable Local Supply Chains: An exploratory study of Welsh Manufacturing Companies 656  
Jacqueline Marsh, Michael Ryan, Anthony Soroka

Control Architectures for Industrial Additive Manufacturing Systems 668  
Daniel Eyers
Contents

The Speed Dependent Heterogeneous Fixed Fleet Vehicle Routing Problem with Backhauls and Environmental Considerations 680
Jose Molina, Ignacio Eguia, Jesus Racero