



CIRP Life Cycle Engineering Conference 2018 detailed program

10:10 - 11:30	Monday, 30 April	Congress room
MK01: Invited Keynotes		
<i>Chair: M.Z. Hauschild</i>		
10:10	Target-Driven Life Cycle Engineering: Staying within the Planetary Boundaries <i>S. Kara, M.Z. Hauschild, C. Herrmann</i>	MK01-01
10:50	A critique of life cycle assessment; where are the people? <i>T.G. Gutowski</i>	MK01-02

11:45 - 13:05	Monday, 30 April	Congress room
MS01: Life Cycle Engineering		
<i>Chair: S. Kara, Ö.S. Ganiyusufoglu</i>		
11:45	Introduction	
11:50	Product life cycle design for sustainable value creation: methods of sustainable product development in the context of high value engineering <i>J. Tao, S. Yu</i>	MS01-01
12:05	Life Cycle Engineering from the perspective of an engineering consultancy <i>C. Collin, A. Linnet, A.Q. Secher</i>	MS01-02
12:20	Life cycle engineering based on visual analytics <i>A. Kaluza, S. Gellrich, F. Cerdas, S. Thiede, C. Herrmann</i>	MS01-03
12:35	Life cycle engineering of carbon fibres for lightweight structures <i>A. Dé, A. Kaluza, D. Kurle, C. Herrmann, S. Kara, R. Varley</i>	MS01-04
12:50	A Methodical Approach for an Economic Assessment of Joining Technologies under Risk – Optimized Decision-making in Automobile Body Development <i>S.A. Choudry, S. Sandmann, D. Landgrebe</i>	MS01-05

15:00 - 16:20	Monday, 30 April	Congress room
MS02: Sustainable Manufacturing Strategies		
<i>Chair: T.S. Spengler, H.-C. Zhang</i>		
15:00	Introduction	
15:05	Sustainability assessment framework for manufacturing sector – a conceptual model <i>V. Bhakar, A.K. Digalwar, K.S. Sangwan</i>	MS02-01
15:20	A Methodology to Align Core Manufacturing Capabilities with Sustainable Manufacturing Strategies <i>I. Barletta, C. Berlin, M. Despeisse, E. van Voorthuysen, B. Johansson</i>	MS02-02
15:35	A Pathway Towards Sustainable Manufacturing for Mid-size Manufacturers <i>J.-K. Choi, R. Schuessler, M. Ising, D. Kelley, K. Kissock</i>	MS02-03
15:50	Increasing Resource Efficiency of Manufacturing Systems using a Knowledge-Based System <i>S. Blume, C. Herrmann, S. Thiede</i>	MS02-04
16:05	Integrating Sustainability in the Development and Operation of High-volume Production Lines <i>P.M. Stotz, N. Bey</i>	MS02-05

16:50 - 17:55	Monday, 30 April	Congress room
MS03: Implementing the SDGs in Life Cycle Engineering		
<i>Chair: A. Laurent, M. Owsianiak</i>		
16:50	Introduction	

16:55	Sustainable Development Goals as a guideline for indicator selection in Life Cycle Sustainability Assessment <i>C. Wulf, J. Werker, P. Zapp, A. Schreiber, H. Schlör, W. Kuckshinrichs</i>	MS03-01
17:10	Designing Future Visions of Sustainable Consumption and Production in Southeast Asia <i>Y. Kishita, S. Kuroyama, M. Matsumoto, M. Kojima, Y. Umeda</i>	MS03-02
17:25	Urban factories and their potential contribution to the sustainable development of cities <i>M. Juraschek, M. Bucherer, F. Schnabel, H. Hoffschroer, B. Vossen, F. Kreuz, S. Thiede, C. Herrmann</i>	MS03-03
17:40	Construction Product Declarations and Sustainable Development Goals for Small and Medium Construction Enterprises <i>A.Q. Secher, C. Collin, A. Linnet</i>	MS03-04

11:45 - 13:05	Monday, 30 April	Room 101
MS04: Sustainability of waste management systems		
Chair: <i>L. Rigamonti, M. Ryberg</i>		
11:45	Introduction	
11:50	Environmental performance of waste management in an Italian region: how LCI modelling framework could influence the results <i>M. Pini, P. Neri, A.M. Ferrari</i>	MS04-01
12:05	Environmental assessment of end-of-life textiles in Denmark <i>A. Koliqkioni, K. Parajuly, B.L. Sørensen, C. Cimpan</i>	MS04-02
12:20	Reuse of tires textile fibers in plastic compounds: is this scenario environmentally sustainable? <i>M. Marconi, D. Landi, I. Meo, M. Germani (presented by A. Colli)</i>	MS04-03
12:35	A benchmark study of waste tyre recycling in South Africa to European Union Practice <i>M.R. Sebola, P.T. Mativenga, J. Pretorius</i>	MS04-04
12:50	Managing supply chain complexity: foresight for wind turbine composite waste <i>A.A.M. Sultan, P.T. Mativenga, E. Lou</i>	MS04-05

15:00 - 16:20	Monday, 30 April	Room 101
MS05: Towards sustainable e-waste management		
Chair: <i>J. Duflou, Y. Dong</i>		
15:00	Introduction	
15:05	Optimized collection of EoL electronic products for Circular economy: A techno-economic assessment <i>E. Angouria-Tsorochidou, C. Cimpan, K. Parajuly</i>	MS05-01
15:20	Waste management of discarded cell phones and proposal of material recovery techniques <i>E. Wansi, P. D'Ans, L. Gonda, T. Segato, M. Degrez</i>	MS05-02
15:35	Enhancing reuse and resource recovery of electrical and electronic equipment with reverse logistics to meet carbon reduction targets <i>C. Cole, A. Gnanapragasam, J. Singh, T. Cooper</i>	MS05-03
15:50	End-of-life management of computers in Brussels: environmental comparison of two treatment chains <i>L. Gonda, M. Degrez</i>	MS05-04
16:05	Discussion and/or closure (will be decided by session chairs)	

16:50 - 17:55	Monday, 30 April	Room 101
MS06: Planning and design for disassembly		
Chair: <i>Y. Umeda, L. Alting</i>		
16:50	Introduction	

16:55	Forecasting real disassembly time of industrial batteries based on virtual MTM-UAS data <i>T.E. Schwarz, W. Rübenbauer, B. Rutrecht, R. Pomberger</i>	MS06-01
17:10	A semi-automatic system for efficient recovery of rare earth permanent magnets from hard disk drives <i>T.R. Simon, L. Cong, Y. Zhai, Y. Zhu, F. Zhao</i>	MS06-02
17:25	Integrated workstation design and buffer allocation in disassembly systems for remanufacturing <i>N. Shabanpour, M. Colledani</i>	MS06-03
17:40	Backtracking Algorithm-based Disassembly Sequence Planning <i>B. Li, L. Ding, D. Hu, S. Zheng</i>	MS06-04

11:45 - 17:40	Monday, 30 April	Room 102
MS07: Developing sustainable infrastructures		
Chair: <i>M. Birkved, K.S. Sangwan, C. Collin, C. Cole</i>		
11:45	Introduction	
11:50	Visualizing interdependencies among sustainability criteria to support multicriteria decision-making processes in building design <i>M. Scherz, B.M. Zunk, A. Passer, H. Kreiner</i>	MS07-01
12:05	Overview of Whole Building Life-Cycle Assessment for Green Building Certification and Ecodesign through Industry Surveys and Interviews <i>T. Bruce-Hyrkäs, P. Pasanen, R. Castro</i>	MS07-02
12:20	LCA and BIM: Integrated assessment and visualization of building elements' embodied impacts for design guidance in early stages <i>M. Röck, A. Hollberg, G. Habert, A. Passer</i>	MS07-03
12:35	Data driven quantification of the temporal scope of building LCAs <i>N. Østergaard, L. Thorsted, S. Miraglia, M. Birkved, F.N. Rasmussen, H. Birgisdóttir, P. Kalbar, S. Georgiadis</i>	MS07-04
12:50	Life Cycle Assessment applied to circular designed construction materials <i>S. Zanni, I.M. Simion, M. Gavrilescu, A. Bonoli</i>	MS07-05
13:05	Lunch break	
15:05	Sustainability tool to optimise material quantities of steel in the construction industry <i>B. D'Amico, F. Pomponi</i>	MS07-06
15:20	Carbon mitigation in the built environment: an input-output analysis of building materials and components in the UK <i>F. Pomponi, B. D'Amico</i>	MS07-07
15:35	Life cycle assessment of innovative materials for thermal energy storage in buildings <i>R. Horn, M. Burr, D. Fröhlich, S. Gschwander, M. Held, J.P. Lindner, G. Munz, B. Nienborg, P. Schossig</i>	MS07-08
15:50	A preliminary systematic investigation onto sprayed concrete's environmental performance <i>M.R.M. Saade, A. Passer, F. Mittermayr</i>	MS07-09
16:05	A comparative life cycle assessment of hot mixes asphalt containing bituminous binder modified with waste and virgin polymers <i>J. Santos, V. Cerezo, K. Soudani, S. Bressi</i>	MS07-10
16:20	Coffee break	
16:55	Lessons Learned from Life Cycle Assessment and Life Cycle Costing of Two Residential Towers at the University of British Columbia <i>Z. Teshnizi, A. Pilon, S. Storey, D. Lopez, T.M. Froese</i>	MS07-11
17:10	Life cycle assessment of a French single-family house refurbishment: the "Bat-Eco2" case study <i>C. Colli, A. Bataille, E. Antczak, F. Buyle-Bodin</i>	MS07-12
17:25	Environmental performance of advanced window systems in patient rooms <i>N. Eisazadeh, K. Allacker</i>	MS07-13

09:00 - 14:50	Tuesday, 1 May	Congress room
TS01: Maximizing efficiency in processes and systems		
Chair: <i>M. Putz, K. Kellens, S. Yu, P. Kleine-Moellhoff</i>		

9:00	Introduction	
09:05	Data-driven Approach for Discovery of Energy Saving Potentials in Manufacturing Factory <i>B. Song, Y. Ao, L. Xiang, L.K.Y. Ng</i>	TS01-01
09:20	Applying Energy Building Simulation in the Assessment of Energy Efficiency Measures in Factories <i>M. Weeber, E. Ghisi, A. Sauer</i>	TS01-02
09:35	Energy flow analysis of an alternative fuel production facility in South Australia <i>S.J. Kim, A. Thornton, S. Kara</i>	TS01-03
09:50	Environmental Impacts of Cooling Tower Operations - The Influence of Regional Conditions on Energy and Water Demands <i>C. Schulze, B. Raabe, C. Herrmann, S. Thiede</i>	TS01-04
10:05	Decision support for planning techniques in energy efficiency projects <i>M. Süße, J. Stoldt, A. Schlegel, M. Putz</i>	TS01-05
10:20	Coffee break	
10:55	Development of a structured algorithm to identify the status of a machine tool to improve energy and time efficiencies <i>N. Sihag, K.S. Sangwan, S. Pundir</i>	TS01-06
11:10	Understanding energy consumption in a machine tool through energy mapping <i>M.J. Triebe, G.P. Mendis, F. Zhao, J.W. Sutherland</i>	TS01-07
11:25	Energy Load Profile Analysis on Machine Level <i>H. Teiwes, S. Blume, C. Herrmann, M. Rössinger, S. Thiede</i>	TS01-08
11:40	Porous metal bonds increase the resource efficiency for profile grinding <i>B. Denkena, T. Grove, V. Suntharakumaran</i>	TS01-09
11:55	Peak Power Load and Energy Costs Using the Example of the Startup and Idling of a Grinding Machine <i>H. Voet, I.C. Garretson, B. Falk, R.H. Schmitt, B.S. Linke</i>	TS01-10
12:10	Optimization Parameters for Energy Efficiency in End milling <i>L. Zhou, J. Li, F. Li, G. Mendis, J.W. Sutherland</i>	TS01-11
12:25	Lunch break	
13:35	Development of a multi-criteria optimization model for minimizing carbon emissions and processing time during machining <i>N. Sihag, K.S. Sangwan</i>	TS01-12
13:50	MAESTRI Efficiency Framework: The concept supporting the Total Efficiency Index. Application case study in the metalworking sector <i>A.J. Baptista, E.J. Lourenço, E.J. Silva, M.A. Estrela, P. Peças</i>	TS01-13
14:05	New Plant-Technologies for Reducing Carbon Emissions and Costs in Heat Treatment Processes of Aluminium Castings <i>S. Scharf, N. Dischinger, B. Ates, U. Schlegel, N. Stein, H. Stein</i>	TS01-14
14:20	Analysis of Process Parameters affecting Energy Consumption in Plastic Injection Moulding <i>I. Meekers, P. Refalo, A. Rochman</i>	TS01-15
14:35	Tooling for production of the Green Fiber Bottle <i>P. Saxena, G. Bissacco, F.J. Bedka, A. Stolfi</i>	TS01-16

15:20 - 16:40	Tuesday, 1 May	Congress room
TS02: Sustainability of biomaterials		
Chair: M. Owsianiak, Ó. Ögmundarson		
15:20	Introduction	
15:25	Biowaste valorisation in a future circular bioeconomy <i>E.B. Vea, D. Romeo, M. Thomsen</i>	TS02-01
15:40	Comparative study using life cycle approach for the biodiesel production from microalgae grown in wastewater and fresh water <i>S. Raghuvanshi, V. Bhakar, R. Chava, K.S. Sangwan</i>	TS02-02
15:55	Bio-based plastics - a building block for the circular economy? <i>S. Spierling, C. Röttger, V. Venkatachalam, M. Mudersbach, C. Herrmann, H.-J. Endres</i>	TS02-03
16:10	LCA and eco-design: Consequential and attributional approaches for bio-based plastics <i>V. Venkatachalam, S. Spierling, R. Horn, H.-J. Endres</i>	TS02-04

16:25	Life-Cycle Assessment and Life-Cycle Cost study of Banana (<i>Musa sapientum</i>) fiber Biocomposite materials <i>L.J. Rodríguez, C.E. Orrego, I. Ribeiro, P. Peças</i>	TS02-05
-------	--	---------

09:00 - 10:20	Tuesday, 1 May	Room 101
TS03: LCA applications		
Chair: <i>S.I. Olsen, S. Cucurachi</i>		
9:00	Introduction	
09:05	Measuring carbon footprint of an Indian university using life cycle assessment <i>K.S. Sangwan, V. Bhakar, V. Arora, P. Solanki</i>	TS03-01
09:20	Life cycle assessment of the production of rare earth oxides from a Brazilian ore <i>F.M. Lima, G.A. Lovon-Canchumani, M. Sampaio, L.M. Tarazona-Alvarado</i>	TS03-02
09:35	A Comprehensive Life-Cycle Assessment of Locally Oriented Small-Scale Toy Industries: A Study of traditional Channapatna Toys as Against low cost PVC (Poly-Vinyl Chloride) Toys made in China <i>J. Rangaswamy, T. Kumar, K. Bhalla</i>	TS03-03
09:50	An Integrated Rural Development Model based on Comprehensive Life-Cycle Assessment (LCA) of Khadi-Handloom Industry in Rural India <i>K. Bhalla, T. Kumar, J. Rangaswamy</i>	TS03-04
10:05	Life cycle assessment of home smart objects: kitchen hood cases <i>V. Castorani, M. Rossi, M. Germani, M. Mandolini, A. Vita</i>	TS03-05

10:50 - 12:25	Tuesday, 1 May	Room 101
TS04: Sustainability of transport systems		
Chair: <i>O.A. Nielsen, C. Herrmann</i>		
10:50	Introduction	
10:55	Life cycle assessment of hydrogen production and consumption in an isolated territory <i>G. Zhao, A.S. Pedersen</i>	TS04-01
11:10	Use of Liquefied Biomethane (LBM) as a Vehicle Fuel for Road Freight Transportation: A Case Study Evaluating Environmental Performance of Using LBM for Operation of Tractor Trailers <i>K. Shanmugam, M. Tysklind, V.K.K. Upadhyayula</i>	TS04-02
11:25	Considering Battery Degradation in Life Cycle Greenhouse Gas Emission Analysis of Electric Vehicles <i>F. Yang, Y. Xie, Y. Deng, C. Yuan</i>	TS04-03
11:40	Parameters affecting the sustainability trade-off between production and use stages in the automotive lightweight design <i>M. Delogu, L. Zanchi, C.A. Dattilo, M. Ierides</i>	TS04-04
11:55	Life Cycle Assessment of a Hybrid Train – Comparison of Different Propulsion Systems <i>L. Meynerts, J. Brito, I. Ribeiro, P. Peças, S. Claus, U. Götze</i>	TS04-05
12:10	Life cycle model and metrics in shipbuilding: how to use them in the preliminary design phases <i>C. Favi, M. Germani, F. Campi, M. Mandolini, S. Manieri, M. Marconi, A. Vita</i>	TS04-06

13:30 - 16:10	Tuesday, 1 May	Room 101
TS05: Sustainability in additive manufacturing		
Chair: <i>T. Gutowski, O. Kerbrat</i>		
13:30	Introduction	
13:35	Environmental Performance and Key Characteristics in Additive Manufacturing: A Literature Review <i>Y.I. Al-Meslemj, N. Anwer, L. Mathieu</i>	TS05-01

13:50	The role of re-design for Additive Manufacturing on the process environmental performance <i>P.C. Priarone, G. Ingarao, V. Lunetto, R. Di Lorenzo, L. Settineri</i>	TS05-02
14:05	Impact of Total Build Height and Batch Size on Environmental Performance of Electron Beam Melting <i>V.T. Le, H. Paris</i>	TS05-03
14:20	A Sustainability Assessment Framework for Dynamic Cloud-based Distributed Manufacturing <i>H.P.N. Nagarajan, A.S. Raman, K.R. Haapala</i>	TS05-04
14:35	A Technical Assessment of Product/Component Re-manufacturability for Additive Remanufacturing <i>Y. Lahrou, D. Brissaud</i>	TS05-05
14:50	Coffee break	
15:25	Dual-objective analysis for desktop FDM printers: energy consumption and surface roughness <i>T. Peng, F. Yan</i>	TS05-06
15:40	Energy and cost assessment of 3D printed mobile case covers <i>P. Minetola, D. Eyers</i>	TS05-07
15:55	Framework to combine technical, economic and environmental points of view of additive manufacturing processes <i>M. Yosofi, O. Kerbrat, P. Mognol</i>	TS05-08

09:00 - 10:20	Tuesday, 1 May	Room 102
TS06: Sustainability in product-service systems		
Chair: <i>D. Brissaud, R. Stewart</i>		
9:00	Introduction	
09:05	Exploring circular strategy combinations - towards understanding the role of PSS <i>F. Blomsma, L. Kjaer, D. Pigosso, T. McAlone, S. Lloyd</i>	TS06-01
09:20	Literature reviews: Life Cycle Assessment in the context of Product-Service Systems and the Textile Industry <i>F.M. Piontek, M. Müller</i>	TS06-02
09:35	A framework of Energy Services: from traditional contracts to Product-Service System (PSS) <i>D. Mourtzis, N. Bolj, K. Alexopoulos, D. Rózycki</i>	TS06-03
09:50	Toward Developing a Design Method of Personalization: Proposal of a Personalization Procedure <i>K. Kaneko, Y. Kishita, Y. Umeda</i>	TS06-04
10:05	Systematization of Virtual Product Twin Models in the Context of Smart Product Reconfiguration during the Product Use Phase <i>M. Abramovici, P. Savarino, J.C. Göbel, S. Adwernat, P. Gebus</i>	TS06-05

10:50 - 12:25	Tuesday, 1 May	Room 102
TS07: From a digital to a sustainable world		
Chair: <i>S. Skerlos, S. Thiede</i>		
10:50	Introduction	
10:55	Exploring the potentials of mixed reality for life cycle engineering <i>M. Juraschek, L. Büth, F. Cerdas, A. Kaluza, S. Thiede, C. Herrmann</i>	TS07-01
11:10	Environmental Sustainability of Cyber Physical Production Systems <i>S. Thiede</i>	TS07-02
11:25	An IoT based approach for energy flexible control of production systems <i>J. Schulz, R.S.-H. Popp, V.M. Scharmer, M.F. Zaeh</i>	TS07-03
11:40	An IoT-enabled approach for energy monitoring and analysis of die casting machines <i>W. Liu, R. Tang, T. Peng</i>	TS07-04
11:55	IoT-enabled Dynamic Optimisation for Sustainable Reverse Logistics <i>S. Liu, G. Zhang, L. Wang</i>	TS07-05

12:10	Challenges in coupling digital payments data and input-output data to change consumption patterns <i>M. Pizzol, E. Vighi, R. Sacchi</i>	TS07-06
-------	--	---------

13:30 - 14:50	Tuesday, 1 May	Room 102
TS08: Sustainability of urban systems		
Chair: C. Herrmann, J. Low		
13:30	Introduction	
13:35	Life cycle oriented industrial value creation in cities <i>M. Juraschek, E.J. Becht, L. Büth, S. Thiede, S. Kara, C. Herrmann</i>	TS08-01
13:50	The assessment of urban environmental impacts through the City Environmental Footprint: methodological framework and first approach to the built environment <i>N. Mirabella, K. Allacker</i>	TS08-02
14:05	A proposal to integrate system dynamics and carbon metabolism for urban planning <i>T. Elliot, B. Rugani, J. Babí Almenar, S. Niza</i>	TS08-03
14:20	A Methodology Concept for Territorial Metabolism – Life Cycle Assessment: Challenges and Opportunities in Scaling from Urban to Territorial Assessment <i>J. Sohn, A. Croxatto Vega, M. Birkved</i>	TS08-04
14:35	Integration of Waste Supply and Use Data into Regional Footprints: Case Study on the Generation and Use of Waste from Consumption and Production Activities in Brussels <i>V. Zeller, E. Towa, M. Degrez, W.M.J. Achten</i>	TS08-05

15:20 - 16:25	Tuesday, 1 May	Room 102
TS09: Sustainability assessment in a circular economy context		
Chair: M. Overcash, L. Laumann Kjaer		
15:20	Introduction	
15:25	Circular economy through objectives - Development of a proceeding to understand and shape a circular economy using value-focused thinking <i>C.J. Velte, K. Scheller, R. Steinhilper</i>	TS09-01
15:40	IMPACT: a tool for R&D management of circular economy innovations <i>J. Verstraeten-Jochemsen, E. Keijzer, T. van Harmelen, L. Kootstra, P. Kuindersma, R. Koch</i>	TS09-02
15:55	Development of an Evaluation Tool for Engineering Sustainable Recycling Pathways <i>G. Grimaud, N. Perry, B. Laratte</i>	TS09-03
16:10	Life Cycle Gaps: Interpreting LCA Results with a Circular Economy Mindset <i>M. Dieterle, P. Schäfer, T. Viere</i>	TS09-04

09:00 - 10:20	Tuesday, 1 May	Room 104
TS10: Enabling sustainable food production systems		
Chair: B. Weidema, F. Bohnes		
9:00	Introduction	
09:05	LCA Towards Sustainable Agriculture: The Case Study Of Cupuaçu Jam From Agroforestry <i>F. Recanati, A. Arrigoni, G. Scaccabarozzi, D. Marveggio, P. Melià, G. Dotelli</i>	TS10-01
09:20	Environmental impacts of urban hydroponics in Europe: a case study in Lyon <i>D. Romeo, E.B. Veà, M. Thomsen</i>	TS10-02
09:35	Eco-designing Aquaponics: a case study of an experimental production system in Belgium <i>A.A. Forchino, V. Gennotte, S. Maiolo, D. Brigolin, C. Mélard, R. Pastres</i>	TS10-03

09:50	Combined Fish and Lettuce Cultivation: An Aquaponics Life Cycle Assessment <i>A. Cohen, S. Malone, Z. Morris, M. Weissburg, B. Bras</i>	TS10-04
10:05	Industrial symbiosis for greener horticulture practices: the CO2 enrichment from energy intensive industrial processes <i>B. Marchi, S. Zanoni, M. Pasetti</i>	TS10-05

10:50 - 12:25	Tuesday, 1 May	Room 104
TS11: Industrial symbiosis		
Chair: <i>B. Song, N. Bey</i>		
10:50	Introduction	
10:55	Industrial symbiosis implementation by leveraging on process efficiency methodologies <i>M. Holgado, M. Benedetti, S. Evans, A.J. Baptista, E.J. Lourenço</i>	TS11-01
11:10	A Collaboration Platform for Enabling Industrial Symbiosis: Application of the Database Engine for Waste-to-Resource Matching <i>J.S.C. Low, T.B. Tjandra, F. Yunus, S.Y. Chung, D.Z.L. Tan, B. Raabe, Y.T. Ng, Z. Yeo, S. Bressan, S. Ramakrishna, C. Herrmann</i>	TS11-02
11:25	The Application of Detrital Actors in Industrial Systems <i>S. Malone, A.R. Cohen, B. Bras, M. Weissburg</i>	TS11-03
11:40	Towards a biologically-inspired urban-industrial ecosystem <i>Z. Morris, M. Weissburg, B. Bras</i>	TS11-04
11:55	Sustainability-based optimization criteria for industrial symbiosis: the Symbioptima case <i>C. Brondi, S. Cornago, A. Ballarino, A. Avai, D. Pietrarola, U. Dellepiane, M. Niero</i>	TS11-05
12:10	Discussion and/or closure (will be decided by session chairs)	

13:30 - 15:55	Tuesday, 1 May	Room 104
TS12: Maintenance and Durability		
Chair: <i>W. Dewulf, Y. Umeda</i>		
13:30	Introduction	
13:35	Maintenance optimization: Application of remanufacturing and repair strategies <i>J. Wakiry, L. Pintelon, P.N. Muchiri, P. Chemweno</i>	TS12-01
13:50	Resource Efficient Regrinding of Cemented Carbide Milling Tools <i>B. Denkena, T. Grove, M. Theuer, Y. Liu</i>	TS12-02
14:05	Characterization of machinability and environmental impact of cryogenic turning of Ti-6Al-4V <i>A. Damir, A. Sadek, H. Attia</i>	TS12-03
14:20	Development of an approach for assessing the reparability and upgradability of Energy-related Products <i>M. Cordella, J. Sanfelix, F. Alfieri</i>	TS12-04
14:35	An approach to the assessment of durability of Energy-related Products <i>F. Alfieri, M. Cordella, J. Sanfelix, N. Dodd</i>	TS12-05
14:50	Coffee break	
15:25	Identification of Critical Components using ANP for Implementation of Reliability Centered Maintenance <i>G. Gupta, R.P. Mishra</i>	TS12-06
15:40	Consumer perspectives on longevity and reliability: a national study of purchasing factors across eighteen product categories <i>A. Gnanapragasam, C. Cole, J. Singh, T. Cooper</i>	TS12-07

16:05 - 16:40	Tuesday, 1 May	Room 104
TS13: Teaching in life cycle engineering		

<i>Chair: K. Haapala, M.S. Jørgensen</i>		
16:05	Introduction	
16:10	Teaching sustainability leadership in manufacturing: a reflection on the educational benefits of the board game Factory Heroes <i>M. Despeisse</i>	TS13-01
16:25	Sustainability and LCA in engineering education - A course curriculum <i>S.I. Olsen, P. Fantke, A. Laurent, M. Birkved, N. Bey, M.Z. Hauschild</i>	TS13-02

09:00 - 10:20	Tuesday, 1 May	Room 105
TS14: Energy supply for manufacturing		
<i>Chair: F. Zhao, T.K. Lien</i>		
9:00	Introduction	
09:05	Decentral Control Strategies for Demand-Side Management by Industrial Heating and Cooling Devices with Discontinuous Operation Mode <i>N. Strobel, E. Abele</i>	TS14-01
09:20	Agent Based Simulation Model of Virtual Power Plants for greener Manufacturing <i>S. Wolmann, M. Zarte, J. Kittel, A. Pechmann</i>	TS14-02
09:35	Model-based planning of energy flexible technical building services in production plants to integrate variable renewable energies <i>D. Flum, E. Abele, O. Reidel</i>	TS14-03
09:50	Simulative analysis of a flexible, robust and sustainable energy supply through industrial Smart-DC-Grid with distributed grid management <i>D.A. Schaab, S. Weckmann, T. Kuhlmann, A. Sauer</i>	TS14-04
10:05	Sizing a Hybrid Renewable Energy System to Reduce Energy Costs at Various Levels of Robustness for an Industrial Site <i>A. Thornton, S.-J. Kim, S. Kara</i>	TS14-05

10:50 - 12:25	Tuesday, 1 May	Room 105
TS15: Increasing the share of renewable energy in the global energy mix		
<i>Chair: A. Laurent, S. Fabbri</i>		
10:50	Introduction	
10:55	Comparative analysis for solar energy based learning factory: Case study for TU Braunschweig and BITS Pilani <i>K.S. Sangwan, C. Herrmann, M.S. Soni, S. Jakhar, G. Posselt, N. Sihag, V. Bhakar</i>	TS15-01
11:10	Case Analysis of Photovoltaic System Shared by a Small Enterprise and a Household <i>M. Zarte, A. Pechmann</i>	TS15-02
11:25	Taking evolution into account in a parametric LCA model for PV panels <i>E. Bracquene, J.R. Peeters, W. Dewulf, J.R. Dufflou</i>	TS15-03
11:40	Sustainability Assessment of Concentrated Solar Power (CSP) Tower Plants – Integrating LCA, LCC and LCWE in one Framework <i>N. Ko, M. Lorenz, R. Horn, H. Krieg, M. Baumann</i>	TS15-04
11:55	Affordable Process for the Production of Strontium Bromide used in Low Grade Heat Recovery Applications <i>D. Gilles, T. Segato, E. Courbon, M. Degrez, P. D'Ans</i>	TS15-05
12:10	Discussion and/or closure (will be decided by session chairs)	

13:30 - 14:50	Tuesday, 1 May	Room 105
TS16: Sustainable management of water		
<i>Chair: J. Sutherland, K.S. Sangwan</i>		
13:30	Introduction	
13:35	Life cycle assessment of groundwater supply system in a hyper-arid region of India <i>P. Bhakar, A. Pratap Singh</i>	TS16-01

13:50	Life Cycle Tradeoffs in a Feedback Device for Reducing Water Consumption <i>C. Telenko, N. Benzoni</i>	TS16-02
14:05	Facing the information leaks in industrial water systems: A concept for proxy measurements to support water metering audits <i>D. Seiler, D. Donovan, G.E. O'Donnell</i>	TS16-03
14:20	Integrated Greywater Management Systems: A Design Proposal for Efficient and Decentralised Greywater Sewage Treatment <i>S.S. Ashok, T. Kumar, K. Bhalla</i>	TS16-04
14:35	Discussion and/or closure (will be decided by session chairs)	

09:00 - 10:20	Wednesday, 2 May	Congress room
WK01: Invited Keynotes		
<i>Chair: M.Z. Hauschild</i>		
09:00	Show me the Money – Societal LCC or Optimizing for Societal and Business Value in Core Business Transactions <i>Y. Risz, C. Cammarata, C. Wellise, M. Swibel</i>	WK02-01
09:40	The UN Sustainable Development Goals (SDGs) are a great gift to business! <i>C.S. Pedersen</i>	WK02-02

10:50 - 12:25	Wednesday, 2 May	Congress room
WS01: Circular economy and business models		
<i>Chair: M. Sodhi, R. Stewart</i>		
10:50	Introduction	
10:55	Sustainable qualifying criteria for designing circular business models <i>M. de Pádua Pieroni, D.C.A. Pigosso, T.C. McAlone</i>	WS01-01
11:10	A methodological approach to development of circular economy options in businesses <i>M.S. Jørgensen, A. Remmen</i>	WS01-02
11:25	Using Values Management for Shifting Companies to Circular Economy <i>T. Stec, P. Zwolinski</i>	WS01-03
11:40	The Role of Life Cycle Sustainability Assessment in the Implementation of Circular Economy Principles in Organizations <i>M. Niero, X.C. Schmidt Rivera</i>	WS01-04
11:55	Approach to enable a Material Efficiency-Strategy for Small and Medium Sized Manufacturing Enterprises <i>P. Kleine-Moellhoff, A.T. Braun, V. Reichenberger, S. Seiter</i>	WS01-05
12:10	Exploring the implementation of a circular economy strategy: the case of a closed-loop supply of aluminum beverage cans <i>R. Stewart, M. Niero, K. Murdock, S.I. Olsen</i>	WS01-06

13:30 - 14:50	Wednesday, 2 May	Congress room
WS02: Reducing waste generation through reuse and recycling		
<i>Chair: P. Mativenga, M. Niero</i>		
13:30	Introduction	
13:35	Modelling and Assessment of Product Recovery Strategies through System Dynamics <i>Y.A. Alamerew, D. Brissaud</i>	WS02-01
13:50	A Study of Formal Post-products Collected to Reuse Business Structures on Resource Sustainability through System Dynamics <i>J. Wang, W. Li, N. Mishima</i>	WS02-02
14:05	Lifecycle simulation method for system of systems focusing on interaction modeling <i>H. Murata, H. Kobayashi, S. Fukushige</i>	WS02-03
14:20	The Impact of Joining Choices on Vehicle Recycling Systems <i>V.K. Soo, P. Compston, M. Doolan</i>	WS02-04

14:35	Intermediate bulk containers re-use in the circular economy: an LCA evaluation <i>L. Biganzoli, L. Rigamonti, M. Grosso</i>	WS02-05
-------	--	---------

10:50 - 14:50	Wednesday, 2 May	Room 101
---------------	------------------	----------

WS03: Ecodesign

Chair: *T.C. McAloone, M. Toxopeus*

10:50	Introduction	
10:55	Towards operable criteria of eco-innovation and eco-ideation tools for the early design phases <i>O. Pialot, D. Millet</i>	WS03-01
11:10	Development of industry-focused, Life Cycle Assessment enhanced Eco-Design software <i>D. Wehner, X. Chen, L. Petruccelli, K. Marshall, A. Clifton, S. Schulz</i>	WS03-02
11:25	Function-driven Investigation of Non-renewable Energy Use and Greenhouse Gas Emissions for Material Selection in Food Packaging Applications: Case Study of Yoghurt Packaging <i>A. Aggarwal, M. Schmid, M.K. Patel, H.-C. Langowski</i>	WS03-03
11:40	A framework for determining the life time energy consumption of a product at the concept design stage <i>S.M. Ibbotson, S. Kara</i>	WS03-04
11:55	Virtual eco-design: how to use virtual prototyping to develop energy-labelling compliant products <i>A.C. Russo, M. Rossi, D. Landi, M. Germani, C. Favi</i>	WS03-05
12:10	Energy Label Directive: current limitations and guidelines for the improvement <i>A.C. Russo, M. Rossi, M. Germani, C. Favi</i>	WS03-06
12:25	Lunch break	
13:35	A Life Cycle Ecological Sensitivity Analysis Method for Eco-Design Decision Making of Machine Tool <i>D. Zeng, H. Cao, S. Jafar, Y. Tan, S. Su</i>	WS03-07
13:50	Lean Design-for-X methodology: Integrating Modular Design, Structural Optimization and Ecodesign in a machine tool case study <i>A.J. Baptista, D. Peixoto, A.D. Ferreira, J.P. Pereira</i>	WS03-08
14:05	Product Recoverability: A Review of Assessment Methods <i>J.M. Leal, S. Pompidou, C. Charbuillet, N. Perry</i>	WS03-09
14:20	Supporting product development with a practical tool for applying the strategy of resource circulation <i>M.E. Toxopeus, N.B. van den Hout, B.G. van Diepen</i>	WS03-10
14:35	Ecodesign of personal computers: an analysis of the potentials of material efficiency options <i>P. Tecchio, F. Ardente, M. Marwede, C. Clemm, G. Dimitrova, F. Mathieux</i>	WS03-11

10:50 - 14:50	Wednesday, 2 May	Room 102
---------------	------------------	----------

WS04: LCA methodology

Chair: *M. Pizzol, A. Leclerc*

10:50	Introduction	
10:55	A Taxonomy for Technology Models used in Environmental Impact Studies <i>C.L. Magee</i>	WS04-01
11:10	Advancements in Unit Process Life Cycle Inventories (UPLCI) Tools <i>M. Overcash, E. Griffing, E. Vozzola, J. Twomey, W. Flanagan, J. Isaacs</i>	WS04-02
11:25	A Meta-model based Approach for LCA-oriented Product Data Management <i>J. Tao, S. Yu</i>	WS04-03
11:40	Spatially differentiated sustainability assessment for the design of global supply chains <i>C. Thies, K. Kieckhäfer, T.S. Spengler, M.S. Sodhi</i>	WS04-04
11:55	Estimating chemical footprint on high-resolution geospatial grid <i>A. Makarova, P. Shlyakhov, N. Tarasova</i>	WS04-05
12:10	Structuring complex results using network maps and hierarchical charts <i>C.A. Lanters, P. Fantke</i>	WS04-06

12:25	<i>Lunch break</i>	
13:35	Relating the Global Burden of Disease to life cycles <i>B. Weidema , P. Fantke</i>	WS04-07
13:50	Prospective assessment of steel manufacturing relative to Planetary Boundaries: Calling for life cycle solution <i>M.W. Ryberg , P. Wang, S. Kara, M.Z. Hauschild</i>	WS04-08
14:05	Ex-ante LCA of emerging technologies <i>S. Cucurachi , C. van der Giesen, J. Guinée</i>	WS04-09
14:20	Organizational Life Cycle Assessment: the introduction of the production allocation burden <i>A. Manzardo , A. Loss, M. Niero, C. Vianello, A. Scipioni</i>	WS04-10
14:35	Exploring Deep Uncertainty Approaches for Application in Life Cycle Engineering <i>M. Tegeltija , J. Oehmen, I. Kozin, J. Kwakkel</i>	WS04-11

Session Schedule - Abbreviation explanation	
MS01-04	Example: Monday Session 1 Presentation 4
M,T,W	M-Monday, T-Tuesday, W- Wednesday
S,K	S-Session, K-Keynote
01	Session number
04	Presentation number