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## Chairs' Welcome

### 6<sup>th</sup> International Conference on Sustainable Design and Manufacturing SDM-19

Welcome to the 6<sup>th</sup> International Conference on Sustainable Design and Manufacturing (SDM-19) conference, being held in Budapest, 4<sup>th</sup> -5<sup>th</sup> July 2019, organised by KES International in partnership with York University, UK.

We would like to take the opportunity to thank our authors, reviewers, General Track and Special Invited session chairs for all the hard work they have put in making sure the papers accepted for the conference are of excellent quality. Thank you all!

We got two renowned guest speakers: Prof. Kai Cheng (Brunel University London, UK) with a talk on *“Multiscale sustainable manufacturing: the industrial-feasible approach and its implementation and application perspectives”* and Prof. Fazleena Badurdeen (University of Kentucky, USA) with a talk on *“Towards Product Design for Circular Economy in Industry 4.0 Era”*. We are honoured with their presence and for sharing their expertise with us at the Conference.

There will be presentations of latest research from our SDM community, comprising several streams from Sustainable Design to Circular Economy, with contributors from a wider range of Higher Education and Research Institutions around the world.

Conference submissions were subjected to a blind peer-review process. Only the best of these were selected for presentation at the conference and publication in the proceedings in a volume in the KES-Springer 'Smart Innovation, Systems and Technologies' series.

If you have any questions, please do not hesitate to talk to any of the chairs or the conference organisation team.

We hope you enjoy the conference.

***Prof. Peter Ball, York University, UK***

***Dr Luisa Huatuco, York University, UK***

***Prof. Robert Howlett, Bournemouth University, UK***

***SDM19 Conference Chairs***

## 11th International Conference on Sustainability in Energy and Buildings SEB-19

The 11th International Conference on Sustainability and Energy in Buildings 2019 (SEB19) is a major international conference, being held in Budapest, 4<sup>th</sup> -5<sup>th</sup> July 2019 organised by KES International in partnership with Cardiff Metropolitan University, Wales, UK.

SEB-19 invited contributions on a range of topics related to sustainable buildings and explored innovative themes regarding sustainable energy systems.

The aim of the conference was to bring together researchers and government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective. The conference formed an exciting chance to present, interact, and learn about the latest research and practical developments on the subject.

The conference featured General Tracks chaired by experts in the field, and in addition 13 Invited Sessions were proposed by prominent researchers.

SEB-19 featured two keynote speakers: Philippe Moseley, Senior Project Advisor from the Executive Agency for Small and Medium-sized Enterprises (EASME), at the European Commission, who gave a talk entitled '*EU support to decarbonise the building stock*' and Prof Fernanda Rodrigues, University of Aveiro, Portugal, who gave a talk entitled '*Climate Changes Impact on the durability and energy performance of buildings*'.

The conference attracted submissions from around the world. Submissions for the Full-Paper Track were subjected to a blind peer-review process. Only the best of these were selected for presentation at the conference and publication in the proceedings in a volume in the KES-Springer 'Smart Innovation, Systems and Technologies' series. Submissions for the Short Paper Track were subjected to a 'lighter-touch' review and may be published in an online medium or we are considering an additional volume in the new KES-Springer series 'Advances in Sustainability Science and Technology' (speak to one of the SEB chairs for more information).

Thanks are due to the very many people who have given their time and goodwill freely to make SEB-19 a success. We would like to thank the members of the International Programme Committee who were essential in providing their reviews of the conference papers. We thank the high-profile keynote speakers for providing interesting talks to inform delegates and provoke discussion. Important contributors

to the conference were made by the authors, presenters and delegates without whom the conference could not have taken place, so we offer them our thanks.

It is hoped that you find the conference an interesting, informative and useful experience.

***Prof Robert J. Howlett, Bournemouth University, UK***

***Dr John Littlewood, Cardiff Metropolitan University, Wales, UK***

***SEB-19 Conference Chairs***

## SDM-19

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## Social Events

### Welcome Drinks Reception and Early Registration

#### Wednesday 3rd July 2019

Join us for a welcome cocktail and light snack at the Danubius Hotel on the stunning Margaret Island! Have a chance to register early for the conference, collect your programme and meet the conference team as we all gather in the lovely conference venue.

This event is open to all conference delegates and included in your conference fee.

### Gala Dinner and Awards

#### Thursday 4th July 2019

The Borkatakomba (Wine Catacomb) Restaurant was established in a former wine cellar extending to several branches of the Budafok cellar system, it is the restaurant with the richest traditions. Borkatakomba is more than a restaurant: on one hand a restaurant, on the other hand a theatre. Folk dance ensembles deliver performances specially choreographed for the Borkatakomba, in the accompaniment of Jozsef Balazs's 5-member orchestra in the centre of the restaurant called Theatre Hall.

Join us for a fun evening of incredible food and entertainment and awards.

The evening also encourages social interaction and networking with your colleagues from around the globe.



## Keynote Talks

### Professor Fazleena Badurdeen

Professor of Mechanical Engineering, University of Kentucky, USA

#### Towards Product Design for Circular Economy in Industry 4.0 Era

**Abstract:** To advance the Circular Economy and enhance sustainability performance product development practices must focus on a multi-lifecycle and closed-loop approach to material flow. Integrating the 6Rs of Reduce, Reuse, Recycle, Recover, Redesign and Remanufacture, Product Design for Circular Economy (PDCE) can enable materials/resources to flow through multiple lifecycles increasing end-of-life value recovery opportunities. Comprehensive decision support tools for PDCE can significantly enhance capabilities of the design community to evaluate alternatives and identify more sustainable product designs that can also increase business competitiveness. The utility and effectiveness these tools depends on access to product data for economic, environmental and societal metrics from pre-manufacturing, manufacturing and use through post-use stages. Data from different lifecycle stages is, however, stored in disparate and incompatible systems limiting their interoperability. Thus, in the emerging Industry 4.0 era, next generation PDCE tools must be interfaced with lifecycle data repositories to enhance capabilities for sustainable product design. Digital integration can enable better collaboration among product designers, manufacturing engineers, supply chain partners and other stakeholders during the product design process. This presentation will address the fundamental requirements for PDCE, and present a comprehensive suite of decision support tools to enable more sustainable product design. A novel framework with an interoperable digital thread to integrate data sources from different lifecycle stages to conduct predictive analyses for robust product design decision making will also be examined.



**Biography:** Dr. Fazleena Badurdeen is a Professor in Mechanical Engineering at the University of Kentucky (UK) and is also the Director of Graduate Studies for the online Manufacturing Systems Engineering MS Program. She is a core member of the university's Institute for Sustainable Manufacturing, an internationally recognized center of excellence on sustainable products, processes and systems. Dr. Badurdeen's research interests are in sustainable product design, modeling and analysis of manufacturing systems and supply chains including the development of tools and visualization techniques to support decision making in these areas. Dr. Badurdeen's research has been funded by federal agencies such as the Department of Defense, National Science Foundation, and the National

Institute for Standards and Technology as well as companies including GE Aviation, GE Transportation, and Coronado Mines. She has published over 150 peer reviewed papers and her team has received numerous accolades for their research. She is the founding Chair of the International Forum on Sustainable Manufacturing, is an Associate Editor for the Resources, Conservation, and Recycling journal, and serves on the editorial boards of a number of other journals. She is a member of the Institute of Industrial and Systems Engineers (IISE) and the Society of Manufacturing Engineers (SME). Dr. Badurdeen received her PhD in Integrated (Industrial and Mechanical) Engineering and MS in Industrial Engineering both from Ohio University, USA. She also holds an MBA from the Postgraduate Institute of Management, Sri Lanka and BS in Engineering from the University of Peradeniya, Sri Lanka.

**Professor Kai Cheng**

Chair in Manufacturing Systems, Brunel University, London

**Multiscale sustainable manufacturing: the industrial-feasible approach and its implementation and application perspectives**

**Abstract:** The presentation aims to explore the generic nature and fundamental issues in sustainable manufacturing associated with the tooling - machine/process - shopfloor - factory - manufacturing supply chains, to achieve the comprehensive and scientific understanding of sustainable manufacturing in a multiscale and multi-dimensional context. Furthermore, the industrial feasible approach towards multiscale sustainable manufacturing is presented using the following five delicate application exemplars with their implementation and application perspectives, including:

- 1) Design of internally cooled smart cutting tools, which can be employed for contamination-free machining and "dry" cutting, and thus likely lead to environmentally-friendly machining processes.
- 2) Development of the ERWC (energy-resource-waste-carbon footprint) approach to quantitative analysis of energy consumption and carbon footprint of CNC milling machines, its ultimate goal is to implement ERWC-based algorithms onto CNC controllers and lead to development of next generation Eco-CNC machine tools operating in a sustainable manufacturing manner.
- 3) Further development of the ERWC approach to quantitative analysis of energy consumption and carbon footprint at Automotive paint-shop, and the associated shop-floor processes mapping and optimization.
- 4) Development of the energy management system for automotive manufacturing factories, industrial feasible real-time decision makings are the essential research focus by likely applying advanced modeling and big data techniques. The correlation analysis on quality, productivity and energy consumption in a multi-dimensional manner and the associated complexity impose scientific challenge while in manufacturing terms.
- 5) Investigation on Point-of-Use (POU) manufacturing systems with application to food industry, the research and development is carried out in close collaboration with industrial companies, particularly on design of POU systems, their use in food manufacturing in light of geographically distributed manufacturing supply chains, and the new business model.

The presentation concludes with a further discussion on the potential, applications and challenges of the sustainable manufacturing approaches in broad manufacturing industries.



**Biography:** Professor Kai Cheng was appointed as Chair Professor in Manufacturing Systems and Head of Advanced Manufacturing & Enterprise Engineering (AMEE) Department at Brunel University on 1 May 2006. Professor Cheng has been enjoying his teaching and professional life in the broad area of manufacturing engineering. He is the European editor of the International Journal of Advanced Manufacturing Technology and a member of the editorial board at other three leading international journals in the field. He is a member of the UK

COMEH (Consortium of Manufacturing Engineering Heads) Committee (2001-present), and a member of the IMechE Academic Standards Committee/Panel (2008-present).

Over the last decade or so, Professor Cheng has developed close academic and research collaborations with a number of leading institutions/universities and industrial companies particularly in the USA, Germany, Japan, Korea, Italy, France, Finland, Sweden, Switzerland, Singapore, Canada, China and Hong Kong. In the past four years, Professor Cheng was invited to give keynote speeches at some leading international conferences organized by the ASME, IEEE, IET, IMechE, CSME and KSMTE respectively. In June 2016, he received the BOSS Award from ASME for his contribution at ASME Academic and Research activities. Professor Cheng has published over 200 papers in learned international journals and refereed conferences, authored/edited 6 books and contributed 2 book chapters. Professor Cheng became a Chartered Engineer in 2000 and a Fellow of the IMechE and IET in 2006 and 2004 respectively. Professor Cheng was also honored as the visiting professor at Harbin Institute of Technology since September 2010.

**Philippe Moseley**

Senior Project Advisor, Executive Agency for Small and Medium-sized Enterprises (EASME), European Commission

**EU support to decarbonise the building stock**

**Abstract:** The European Union has supported improvements in the energy performance of buildings for over 15 years, and these efforts have been steadily increasing in ambition and scope. The principal piece of legislation, the Energy Performance of Buildings Directive (EPBD), was first published in 2002 and revised in 2010 and 2018. Funding for research and innovation in energy efficient buildings, and for the market uptake of existing solutions, has been pursued over a similar timescale through programmes such as Intelligent Energy Europe and Horizon 2020. By and large, projects on energy efficient buildings funded through these programmes have directly addressed issues related to the Directive, and they have evolved as the legislation has matured. With the EU soon embarking on a new 7-year funding cycle, it is appropriate to take stock of what its support for improving the energy performance of buildings has achieved, and to look forward to future funding opportunities and what that will mean for the buildings sector.



**Biography:** Philippe Moseley MA(RCA) MSc RIBA works as a Senior Project Advisor at the Energy Unit of the European Commission's Executive Agency for SMEs (EASME) in Brussels. He is responsible for managing the Energy Efficiency part of the Horizon 2020 framework programme for research and innovation, with a focus on the buildings sector. Prior to joining the European

Commission, he worked for some 15 years as a professional architect developing energy efficient buildings across Europe.

**Prof Fernanda Rodrigues**

University of Aveiro, Portugal

**Climate Changes Impact on the durability and energy performance of buildings.**

Professor Fernanda Rodrigues, RISCO, University of Aveiro

Dr Fabiana Belén Silvero, RISCO, National University of Itapúa

Dr Pablo Benítez Mongelós, RISCO, National University of Itapúa

**Abstract:** Earth has been under climate changes along all the time due to natural processes. However, these changes are also caused and accelerated by anthropogenic activities due to the emission of GHG, among which carbon dioxide is one of the most concerning as presenting an alarming increase in the last decades. Currently, scientific observations clearly denote increases in the global mean temperature of the air and oceans, the widespread melting of snow and ice, and the increase in mean sea level joined by more frequent extreme natural phenomena. Urban areas can be an object of greater global risks due to extreme rainfall, floods, droughts, air pollution, water scarcity or thermal stress. These aspects are and will be intensified for the low-income population, living in poor quality housing and frequently in exposed areas, presenting high vulnerability and low resilience against the consequences of those changes and phenomena. For this reason, one of the first adaptation measures to climate changes, in general, is to reduce the population exposure and vulnerability to the current climate. The impacts produced by recent extreme phenomena of heat waves, floods, droughts, cyclones or forest fires, show the vulnerability of some ecosystems to this climatic variability. Among these impacts, it can be mentioned the damage to structures and infrastructure, alteration of ecosystems, disorganisation in food production and water supply, consequences for mental health and human well-being, among others.

Different researchers depict the impact of climate changes on the built environment according to the geographic location that involves materials and constructive elements degradation in all kind of structures and infrastructures. These researches also analyse, develop and evaluate different adaptation techniques to prepare the built environment to resist the consequences of climate changes that must also involve its influence in the operation and maintenance of the constructions.

Maintenance and repair of existing and new constructions, present the challenge of dealing with the uncertainty of climatic phenomena that in the last century did not require further consideration. In recent years, materials have presented a particular vulnerability to aggressive environments, affecting the service life and the economy of construction projects. To consider Projects maintenance, inspection and sustainable refurbishment dynamically, linked with the expected climate variability are nowadays crucial to guarantee not only the durability but also the comfort and wellbeing of the population.

The research work herein presented will focus on the carbonation-induced corrosion of RC structures of recent buildings and in the energy retrofit of heritage housings in a hot humid climate developing country, considering forecasting scenarios of climate changes.

In the scope of carbonation-induced corrosion of RC structures, several studies shown that structures can be affected by the impact of this phenomenon considering its durability highlighting the reduction of its expected service life caused by an increase in the corrosion rate, associated with the rise in temperature and the atmospheric concentrations of CO<sub>2</sub>. So, an optimised methodology for the formulation of maintenance strategies of RC structures subjected to the carbonation-induced corrosion, considering the effects of climate change was developed, based on the numerical modelling of carbonation in RC structures to obtain the degradation curves that show the expected carbonation depth for the next 50 years, under different climate scenarios. With this analysis, it was possible to determine the corrosion initiation and corrosion propagation times for the structures considering several configurations of the principal parameters influencing durability: the quality of the concrete and the cover thickness. Preventive maintenance strategies and repair planning are based on dynamic models for decision-making, considering the cost analysis of the maintenance strategy and the capabilities of the inspection and repair techniques ensuring the durability of the structures through the preventive maintenance approach, were developed.

The main results showed that the carbonation-induced corrosion risk of structures can increase in the future due to the climate change effect. Thus, for the worst climate scenario, in the second half of this century is expected an increase of 25% in the maximum carbonation depth regarding a control scenario. Meanwhile, the time to reach the same maximum carbonation depth of the control scenario can be reduced between 7 and 10 years for the best scenario, depending on the quality of the concrete. Furthermore, the maintenance model developed in this research is easily applicable and allows the formulation of long-term strategies that optimise resources at the lowest cost to deal with this degradation mechanism.

In the scope of thermal comfort and energy efficiency of heritage housing, the simulations, taking in consideration the climate changes effects, show the optimum cost-efficiency measures that lead to a higher indoor comfort, lower energy consumption and GEG emissions.

**Biography:** Fernanda Rodrigues is a civil engineer, with a PhD in Civil Engineering on the topic of the housing conservation state and anomalies assessment. Is an integrated member of the RISCO - Aveiro Research Centre of Risks and Sustainability in Construction and assistant professor in the Civil Engineering Department of the University of Aveiro, in Portugal, where she is the director of the Integrated Master in Civil Engineering. She is the lecturer and responsible for the courses in the area of construction management and qualified expert for thermal performance of buildings.

She is currently involved in research projects on the high energy efficiency of buildings, LCA of retrofit solutions. She has supervised more than 60 master thesis and 10 (5 concluded and 5 ongoing) doctoral thesis in several fields and performed several technical reports on the construction anomalies, its causes and limitation/elimination measures. She is author and co-author of more than 150 publications in international peer-reviewed journals, national and international conferences. Currently is researching in BIM, in energy retrofit of buildings, buildings condition assessment, durability, maintenance and management of buildings.

## Timetable – Wednesday 3 July

18.00-19.30

Early Registration  
Drink Reception

**Timetable – Thursday 4 July**

	Main Plenary	Boroka 1	Boroka 2	Toboz 1	Toboz 2	Jazmin 1
8.00-9.15	<b>Registration</b>					
9.15-9.30	<b>Opening Ceremony</b> Prof Robert J Howlett					
9.30-10.30	<b>Keynote Speaker 1</b> Philippe Moseley Executive Agency for Small and Medium-sized Enterprises (EASME) European Commission EU support to decarbonise the building stock Chair: TBC					
10.30-11.00	<b>Coffee</b>					

	Main Plenary	Boroka 1	Boroka 2	Toboz 1	Toboz 2	Jazmin 1
11.00-13.00	<b>SEB 1</b> G01: Sustainable & Smart Buildings Chair: Dr John Littlewood	<b>SEB 2</b> G02: Energy management in the Smart City & G03 Renewable Energy Technologies & IS03 Sustainable retrofit of existing and historic buildings Chair: Prof. Alfonso Capozzoli	<b>SDM 1</b> Sustainable Technologies in Automotive and Transportation Systems I Chair: Dr. Renata Dobrzynska	<b>SDM 2</b> Sustainable Manufacturing Processes, Technology and Systems Chair: Prof. Giampaolo Campana	<b>SEB 3</b> IS11 Diversifying Building Performance Evaluation – Revealing obscured and emerging issues Chair: Dr Magdalena Baborska-Narozny	<b>SDM 3</b> Systematic Innovation Tools for Eco-Design: Products, Processes and Assessment Methods Chair: Prof Davide Russo
13.00-14.00	<b>Lunch</b>					
14.00-15.00	<b>Keynote Speaker 2</b> Prof. Kai Cheng Brunel University London, UK Multiscale sustainable manufacturing: the industrial-feasible approach and its implementation and application perspectives Chair: TBC					
15.00-15.30	<b>Coffee</b>					

	Main Plenary	Boroka 1	Boroka 2	Toboz 1	Toboz 2	Jazmin 1
15.30-17.30	<b>SDM 4</b> Supply Chain Management and New Business Models in the Circular Economy Co-Chairs: Dr Maria Holgado and Dr Minna Lammi	<b>SDM 5</b> Energy Efficiency Opportunities in Manufacturing Processes and Systems Chair: Dr Emanuele Pagone	<b>SEB 4</b> IS01 Design and Assessment of the Built & Natural Environment for Societal Health & Well-being Chair: Dr. Elisa Di Giuseppe	<b>SEB 5</b> IS06 People energy use in buildings & IS11: Diversifying Building Performance Evaluation – Revealing obscured and emerging issues Chair: Prof. Francesco Causone	<b>SDM 6</b> Sustainability-oriented Industrial Technologies in the domain of Industry 4.0 Chair: Prof. Steffen Scholz	<b>SEB 6</b> G01: Sustainable & Smart Buildings Chair: Dr John Littlewood
TBC	<b>Conference Gala Dinner</b> Borkatakomba (Wine Catacomb) Restaurant					

## Timetable – Friday 5 July

	Main Plenary	Boroka 1	Boroka 2	Toboz 1	Toboz 2	Jazmin 1
8.30-9.30	<b>Registration</b>					
9.30-10.30	<b>Keynote Speaker 3</b> Prof. Fazleena Badurdeen University of Kentucky, USA Towards Product Design for Circular Economy in Industry 4.0 Era Chair: TBC					
10.30-11.00	<b>Coffee</b>					
11.00-13.00	<b>SEB 8</b> IS04: Technologies for Renewable Energy Chair: Dr Nader Anani	<b>SDM 7</b> Green manufacturing with an industrial metabolism and smart access perspective Chair: Prof Hua Zhang	<b>SDM 8</b> Sustainable Technologies in Automotive and Transportation Systems II Chair: Prof Tomasz Abramowski	<b>SEB 9</b> IS08: Low-impact strategies and solutions in design and construction of the built environment Chair: Dr Mahmood Alam	<b>SEB 10</b> IS13: Super Insulating Materials for Energy Efficient Buildings Chair: Dr. Stefano Fantucci	<b>SEB 7</b> G01: Sustainable & Smart Buildings and IS02: Low-energy space cooling and ventilation: environmental, resilient and technological aspects Chair: Assist. Prof. Giacomo Chiesa
13.00-14.00	Lunch					

	Main Plenary	Boroka 1	Boroka 2	Toboz 1	Toboz 2	Jazmin 1
14.00-15.00	<b>Keynote Speaker 4</b> Prof Fernanda Rodrigues University of Aveiro, Portugal Climate Changes Impact on the durability and energy performance of buildings Chair: TBC					
15.00-15.30	<b>Coffee</b>					
15.30-17.30	<b>SDM 9</b> Sustainable Technologies in Automotive and Transportation Systems III Chair: PhD Eng. Agnieszka Deja	<b>SDM 10</b> Sustainable Design, Innovation and Services Chair: Prof. Dr.-ing. Stefan Junk	<b>SEB 12</b> ISO9: Mitigation technologies to counter climate change and urban heat island effect and to improve comfort in urban environment Chair: Prof. Antonio Gagliano	<b>SEB 13</b> Short Papers Chair: Prof. Fernanda Rodrigues	<b>SEB 11</b> ISO7: Urban form and microclimate: energy efficiency of the compact city Chair: Dr. Michele Morganti	<b>SEB 14</b> Short Papers Chair: Prof. Robert Howlett
17.30	<b>Closing Ceremony</b>					

## SDM Paper Presentations

Thursday 4 July

11.00-13.00, Boroka 2

### SDM 1: Sustainable Technologies in Automotive and Transportation Systems I

Chair: Dr. Renata Dobrzyńska

PROSE Paper No	Paper Title / Authors
sdm19-055	The impact of equipment materials on the fire safety of coaches Dr. Renata Dobrzyńska
sdm19-053	Emission of Particles and VOCs at 3D Printing in Automotive Dr Hab. Inz. Tomasz Krolikowski, Dr Inz. Andrzej Blazejewski, Dr Hab. Inz. Sebastian Glowinski, Dr Inz. Kazimierz Kaminski, Mgr Inz. Remigiusz Knitter
sdm19-065	The impact of refrigerants on the efficiency of automo-tive air- conditioning system PhD Wojciech Tuchowski, PhD Karolina Kurtz-orecka
sdm19-045	Selection of sorbents for removing operating fluids at the vehicle dismantling station Dr. Eng. Agnieszka Ubowska, Eng. Monika Olawa

**Thursday 4 July**

**11.00-13.00, Toboz1**

**SDM 2: Sustainable Manufacturing Processes, Technology and Systems**

Chair: Prof. Giampaolo Campana

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-057	Managing uncertainties in LCA dataset selection M. Sc. Simon Pfeuffer, B. Sc. Raed Bouslama, M. Sc. Daniel Wehner
sdm19-069	Lightweight design solutions in the automotive sector: impact analysis for a door structure Dr. Francesco Del Pero, Dr Massimo Delogu, Ms Violeta Fernandez, Mr Marcos Ierides, Mr Kristian Seidel, Mr Dinesh Thirunavukkarasu
sdm19-025	A Life Cycle Assessment Framework for Stereolithography MSc. Eng. Mattia Mele, Prof. Eng. Giampaolo Campana, MSc. Eng. Giulia D'avino
sdm19-005	Investigating level of sustainability in off-site construction Mr Milad Moradibistouni, Doctor Nigel Isaacs, Professor Brenda Vale
sdm19-034	Future Direction of the Sustainable Turning of Difficult-to-Machine Materials. Miss Jasmine Rance, Mr Andrea De Bartolomeis, Miss Stephanie Hall, Dr Alborz Shokrani

**Thursday 4 July**  
**11.00-13.00, Jazmin 1**

**SDM 3: Systematic Innovation Tools for Eco-Design: Products, Processes and Assessment Methods**

Chair: Prof Davide Russo

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-011	A web-based portal for eco-improvement containing guidelines and environmental benefits estimator Prof Davide Russo, Dr Christian Spreafico
sdm19-010	Generating infographics for environmental product declarations (EPDs) with I-Tree software Dr. Christian Spreafico, Prof. Davide Russo
sdm19-001	Eco-design and sustainable development: a speculation about the need for new tools and knowledge Dr. Lorenzo Maccioni, Dr. Eng. PhD Yuri Borgianni
sdm19-002	Environmental lifecycle hotspots and the implementation of eco-design principles: does consistency pay off? Dr. Eng. PhD Yuri Borgianni, Dr. Lorenzo Maccioni, Prof. PhD Daniela Pigosso
sdm19-019	Emotional design and virtual reality in Product Life Cycle Management (PLM) Prof Enrico Vezzetti, Dr Federica Marcolin, Prof Sandro Moos, Miss Francesca Nonis, Prof Maria Grazia Violante
sdm19-024	An investigation of the relations on business areas and recycled materials in circular economy Dr Matteo Spreafico, Dr Giacomo Bersano, PhD Pierre-emmanuel Fayemi

**Thursday 4 July**  
**15.30-17.30, Main Plenary**

**SDM 4: Supply Chain Management and New Business Models in the Circular Economy**

Co-Chairs: Dr Maria Holgado and Dr Minna Lammi

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-041	Closed-Loop Supply Chains in Circular Economy Business Models Dr Maria Holgado, Dr Anna Aminoff
sdm19-040	Turning Finland into a country of circular economy: What kind of a process of change should we seek? Dr Minna Lammi, Dr Maria Antikainen, Dr Markku Anttonen, Director Ian Bamford, Senior Researcher Mika Naumann
sdm19-044	A cross-sectorial synergies identification methodology for industrial symbiosis Mr. Stéphane Ogé, Mr. Alexandre Bredimas, Mr. Gwenaël Leprince Maillère, Mr. Mouad Mouhajir, Mr. Jean-baptiste Quintana, Mr. Charles-xavier Sockeel
sdm19-009	Creating a Taxonomy of Value for a Circular Economy Ms Merryn Haines-gadd, Dr Fiona Charnley
sdm19-039	Development strategies for closing the loop: the roles of the major economies in the transition towards circular economy Senior Researcher Mika Naumanen
sdm19-074	Systematic Creative Waste Innovation for Circular Economy Business: three cases in Sri Lanka and Thailand Dr Curie Park, Prof Steve Evans

**Thursday 4 July**  
**15.30-17.30, Boroka 1**

**SDM 5: Energy Efficiency Opportunities in Manufacturing Processes and Systems**

Chair: Dr Emanuele Pagone

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-036	Life Cycle Assessment of Graphene as Heating Element Dr Emanuele Pagone, Ms Araba Ampah, Dr Konstantinos Salonitis
sdm19-004	A zero energy prefabricated ADU for New Zealand Mr Milad Moradiboustouni, Dr Nigel Isaacs, Professor Brenda Vale
sdm19-021	A Survey on Energy Efficiency in Metal Wire Deposition Processes MSc, Phd Student Angioletta Catalano, MSc, PhD Student Vincenzo Lunetto, PhD, Assist. Prof. Paolo Priarone, PhD, Full Prof. Luca Settineri
sdm19-029	A case study analysis of energy savings achieved through behavioural change and social feedback on manufacturing machines Dr John Cosgrove, Mr Frank Doyle, Mr Bart Van Den Broek
sdm19-020	Needs-based Workshops for Sustainable Consumption and Production in Vietnam Prof Hideki Kobayashi, Dr Shinichi Fukushige, Dr Hidenori Murata, Dr Chuc Nguyen Dinh, Dr Yoshinori Sumimura, Dr Minh Tran
sdm19-042	Sustainability impact assessment of additive manufacturing productive processes Miss Grazia Maria Cappucci

**Thursday 4 July**

**15.30-17:30, Toboz 2**

**SDM 6: Sustainability-oriented Industrial Technologies in the domain of Industry 4.0**

Chair: Prof. Steffen Scholz

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-047	Safe-by Design in 3D printing Dr. Katja Nau, Dr. Steffen Scholz
sdm19-048	Total Cost of Ownership for different state of the art FDM Machines (3D Printers) Ba Janin Fauth, Dr. Ahmed Elkaseer, Dr. Steffen Scholz
sdm19-049	On the Assessment of Thermo-mechanical Degradability of Multi-recycled ABS Polymer for 3D Printing Applications M.Sc. Amal Charles, Mr. Pedro Bassan, Dr. Ahmed Elkaseer, Dr. Ing Tobias Mueller, Dr. Steffen Scholz
sdm19-051	A study on the modelling and simulation of bio-inspired hedgehog spines structures for more efficient use digital manufacturing processes Dr Andrew Rees, Dr Christian Griffiths, Miss Rebecca O'sullivan, Mr Janik Wadlinger
sdm19-056	Internet of Things Solution for Non-Invasive Vital Data Acquisition: A Step Towards Smart Healthcare System Mr. Mahmoud Salem, Dr. Islam El-maddah, Professor Hoda Mohamed, Dr. Khaled Youssef
sdm19-046	Industrial Assistance as a I4.0 Topic - MMAssist Dipl. Ing., MSc Wögerer Christian, Dr. Tscheligi Manfred, MSc Plasch Matthias, Dr. Egger-lampf Sebastian

**Friday 5 July**

**11.00-13:00, Boroka 1**

**SDM 7: Green manufacturing with an industrial metabolism and smart access perspective**

Chair: Prof Hua Zhang

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-073	A knowledge sharing framework for green supply chain management based on blockchain and edge computing Prof Hua Zhang, Mr. Li Shengqiang, Phd Yan Wei, Prof Jiang Zhigang
sdm19-031	Industrial metabolic pathway analysis and flux control for the metallurgical system Prof. Gang Zhao, Dr. Junwen Chen, Prof. Zhigang Jiang, Prof. Hua Zhang
sdm19-023	Evolution of Carbon Emission Mechanism of Blast Furnace Ironmaking Based on Metabolic Flux Balance Dr. Junwen Chen, Master Xing Gao, Prof. Hua Zhang, Prof. Gang Zhao
sdm19-071	Manufacturing process-oriented quantitative evaluation of green performance for iron and steel enterprise Prof. Gang Zhao, Dr. Junwen Chen, Master Dan Ruan, Master Minchao Xie
sdm19-068	The Nondestructive Disassembly Method of Interference Fit of Sleeve-base Structure in the Case of Cooling Excitation Associate Professor Fulin Wang, Master Shuaifei Hao, Master Hongbai Shu, Master Shuai Zhang
sdm19-059	Efficient Production Changeability in food packaging through smart surfaces Mr Khalid Mustafa, Mr Kai Cheng

Friday 5 July

11.00-13.00, Boroka 2

**SDM 8: Sustainable Technologies in Automotive and Transportation Systems II**

Chair: Prof Tomasz Abramowski

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-052	Gait recognition: a challenging mems signal identification Dr Hab. Inz. Tomasz Krolikowski, Dr Inz. Andrzej Blazejewski, Dr Hab. Inz. Sebastian Glowinski, Mgr Inz. Remigiusz Knitter
sdm19-066	Concept of location of filling stations and services of vehicles carrying and running on LNG PhD Eng. Agnieszka Deja, Msc.Eng. Joanna Harasym, Dsc. Eng. Magalena Kaup, Dsc. Eng. Dorota Lozowicka
sdm19-064	The Influence of Refrigerants Used in Air-Conditioning Systems in Motor Vehicles on the Environment PhD Wojciech Tuchowski, Phd Karolina Kurtz-orecka
sdm19-016	Design and Development of a Portable Wireless Axle Load Measuring System for Preventing Road Damages Mr Buddhi Herath, Dr Ranjith Amarasinghe, Mr Janaka Basnayake, Prof Wasantha Mampearachchi, Mr Dimuthu Wijethunge
sdm19-060	The concept of transport organization model in container logistics chains using inland waterway transport PhD Eng. Agnieszka Deja, Dsc.Eng. Magdalena Kaup, PhD Eng. Roma Strulak-Wojcikiewicz
sdm19-035	Multimodal Freight Transportation: Sustainability challenges Ms. Edidiong Udo, Prof. Peter Ball, Dr. Luisa Huatucu

**Friday 5 July****15.30-17.30 Main Plenary****SDM 9: Sustainable Technologies in Automotive and Transportation Systems III**

Chair: PhD Eng. Agnieszka Deja

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-063	Management of ship-generated waste reception at the Port of Szczecin as a key component in the reverse logistics chain PhD Eng. Agnieszka Deja, Dsc.Eng. Magdalena Kaup, PhD Eng. Roma Strulak-Wójcikiewicz,
sdm19-058	Preliminary balance of the cold accumulated in polymetallic nodules stored on the mining ship Prof Tomasz Abramowski, dr Piotr Nikonczuk
sdm19-050	Road transport of high consequence dangerous goods - assessment of terrorist threat (case study) Dr Agnieszka Ubowska, Dr Renata Dobrzyńska
sdm19-061	Energy Efficiency of Renewables to Cover Energy Demands of Petrol Stations Buildings PhD Wojciech Tuchowski, Phd Karolina Kurtz-orecka
sdm19-054	Significant parameters identification for optimal modeling of the harp type flat-plate solar collector for paint shop Dr Hab. Inz. Tomasz Krolikowski, Dr Inz. Andrzej Blazejewski, Dr Inz. Kazimierz Kaminski, Mgr Inz. Remigiusz Knitter

Friday 5 July

15.30-17.30 Boroka 1

**SDM 10: Sustainable Design, Innovation and Services**

Chair: Prof. Dr.-ing. Stefan Junk

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
sdm19-027	An exploratory study to identify the barriers and enablers for plastics reduction in packaging Ms Xuezi Ma, Mr Min Hua, Dr James Moultrie, Dr Curie Park
sdm19-006	Design Merged X for eco-product development Mr Jing Shen, Mr Lichao Peng, Mr Yilun Zhang, Prof Zhinan Zhang
sdm19-008	Sustainable Biodesign Innovation: Integrating Designers, Engineers and Bioscientists Dr. Christina Cogdell
sdm19-013	A Socio-ecological Design Strategy for Measuring Planetary Health Ms Elisabeth Mcallister
sdm19-026	Development of an additively manufactured adaptive wing using Digital Materials Prof. Dr.-ing. Stefan Junk, M.Eng. Philipp Gawron, Prof. Dr. rer. nat. Werner Schröder
sdm19-043	The bottom-up side of eco-innovation: mapping the dynamics of sustainable grassroots innovations Dr. Yannis Mouzakis, Prof. Emmanuel Adamides

## SEB Paper Presentations

Thursday 4 July

11.00-13:00, Main Plenary

### SEB 1: G01: Sustainable & Smart Buildings

Chair: Dr John Littlewood

PROSE Paper No	Paper Title / Authors
seb19f-012	A Conceptual Methodology for Estimating Embodied Carbon Emissions of Buildings in Sri Lanka Mrs Amalka Ranathungage, Dr Zaid Alwan, Dr Nirodha Fernando, Dr Barry Gledson
seb19f-015	Developing a Didactic Thermal Chamber for Building Envelope Material Testing Dr. Bechara Nehme, Dean Paul Abi Khattar Zgheib, Dr. Tilda Akiki, Dr. Fadi Moucharrafi, Dr. Rida Nuwahid, Dean Barbar Zeghondy
seb19f-017	The successful introduction of energy efficiency in Higher Education Institution buildings? Prof. Dr. Dirk Franco, Mr Miguel Casas, Ms Marijke Maes, Ms Marleen Schepers, Mr Lieven Vanstraelen
seb19f-031	Combining conservation and users' behaviors-oriented approaches for sustainable Building Heritage Use: application to a historic underground built environment Dr Benedetta Gregorini, Dr. Gabriele Bernardini, Prof. Marco D'orazio, Dr. Michele Lucesoli, Prof. Enrico Quagliarini
seb19f-038	Towards a user-centered and condition-based approach in Building Operation and Maintenance Dr. Gabriele Bernardini, Prof. Elisa Di Giuseppe

**Thursday 4 July**

**11.00-13:00, Boroka 1**

**SEB 2: G02: Energy management in the Smart City & G03 Renewable Energy Technologies & IS03 Sustainable retrofit of existing and historic buildings**

Chair: Prof. Alfonso Capozzoli

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-010	Using evidence accumulation-based clustering and symbolic transformation to group multiple buildings based on electricity usage patterns Mr. Kehua Li, Prof. Zhenjun Ma, Dr. Jun Ma, Prof. Duane Robinson
seb19f-026	Electrical devices identification driven by features and based on machine learning Dr. Andrea Tundis, MSc. Ali Faizan, Prof. Max Mühlhäuser
seb19f-062	Critical review of ageing mechanisms and state of health estimation methods for battery performance Miss Khadija Saqli, Miss Houda Bouchareb, Mr Kouider Nacer M'sirdi, Mr Mohammed Oudghiri
seb19f-084	Constructive development of an adsorption refrigeration machine with an auxiliary heater for an CO <sub>2</sub> -neutral air conditioning of e-vehicles B.eng. Sebastian Haas, Dr.ing. Michael Walter, M.sc. Stefan Weiherer
seb19f-034	Energy savings and summer thermal comfort for retrofitted buildings: a complex balance Dr. Gianpiero Evola, Eng. Federica Avola, Prof. Luigi Marletta
seb19f-037	Energy consumption and retrofitting potential of unclassified buildings Dr.sc.ing Anatolijs Borodinecs, M.sc.ing. Aleksandrs Geikins, M.sc.ing Aleksejs Prozuments

**Thursday 4 July**  
**11.00-13.00, Toboz 2**

**SEB 3: IS11 Diversifying Building Performance Evaluation – Revealing obscured and emerging issues**

Chair: Dr Magdalena Baborska-Narozny

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-027	Maslow in the Mud: Contrast between qualitative and quantitative assessment of thermal performance in historic buildings. Dr Marcin Kolakowski
seb19f-028	Hidden building performance evaluation sources: What can Trip Advisor and other informal user-generated data tell us? Dr Julie Godefroy
seb19f-085	Research into the possibility of achieving the NZEB standard in Poland in 2021 - architect's perspective prof. Anna Bac
seb19f-095	Considering institutional logics in building performance evaluation research Dr Sonja Oliveira, Dr Magdalena Baborska-narozny
seb19f-097	Ecology of Heat Pump Performance: A socio-technical analysis Dr Lai Fong Chiu, Professor Robert Lowe

**Thursday 4 July**  
**15.30-17.30, Boroka 2**

**SEB 4: IS01 Design and Assessment of the Built & Natural Environment for Societal Health & Well-being**

Chair: Dr. Elisa Di Giuseppe

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-009	Energy and economic analyses for supporting early design stages: introducing uncertainty in simulations Dr Giacomo Chiesa, Professor Bauke De Vries, Dr. Qi Han
seb19f-057	Green Space Factor assessment of high-rise residential areas in Harbin, China Master Student Wang Xuetong, Associate Professor Xing Jun, Associate Professor Lu Ming
seb19f-078	Developing management guidance for Government funded dwelling retrofit schemes to improve occupant quality of life Mr Denis Jahic, Dr John Littlewood, Professor George Karani, Dr Joanne Atkinson, Ms Joanne Kirrane, Professor Andrew Thomas
seb19f-082	Sustainability Issues in Context of Indian Hill Towns Prof. Pushplata Garg, Ms. Harsimran Kaur
seb19f-098	An Evaluation of Offsite Timber Frame Manufacturers in Wales, UK. Mr. Francesco Zaccaro, Dr. John Littlewood, Mr. Robin Lancashire, Mr. Gary Newman, Mr. David Hedges
seb19f-019	LCA integration in the construction industry: A case study of a sustainable building in Aveiro University Eng. Kamar Aljundi, Dr. Ana Dias, Dr. Armando Pinto, Prof. Fernanda Rodrigues

**Thursday 4 July**  
**15.30-17:30, Toboz1**

**SEB 5: IS06 People energy use in buildings & IS11: Diversifying Building Performance Evaluation – Revealing obscured and emerging issues**

Chair: Prof. Francesco Causone

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-050	Citizen engagement in energy efficiency retrofit of public housing buildings: a Lisbon case-study Dr. Catarina Rolim, Dr. Ricardo Gomes
seb19f-081	Innovative User Experience Design and Customer Engagement Approaches for Residential Demand Response Programs MSc. Matteo Barsanti, Prof. Francesco Causone, MSc. Letizia Garbolino, MSc. Muhammad Mansoor, MSc. Giulia Realmonte, MSc. Rita Zeinoun
seb19f-094	A working methodology for deep energy retrofit of residential multi-property buildings Arch. Cecilia Hugony, Prof. Francesco Causone, Prof. Eugenio Morello
seb19f-101	Behavioural change effects on energy use in public housing: a case study Eng. Andrea Sangalli, Prof. Francesco Causone, Phd. Silvia Erba, Prof. Eugenio Morello, Prof. Lorenzo Pagliano, PhD. Giuseppe Salvia
seb19f-100	Understanding residential fuel combustion challenge ? real world study in Wroclaw, Poland Dr Magdalena Baborska-narozny, Dr Agnieszka Chmielewska, Dr Natalia Fidorów-kaprawy, Mgr Krzysztof Piechurski, Mgr Ewelina Stefanowicz, Dr Małgorzata Szulgowska-zgrzywa
seb19f-104	Privacy in domestic Building Performance Evaluation? preliminary framework for analysis Dr Magdalena Baborska-narozny

**Thursday 4 July**

**15.30-17.30, Jazmin 1**

**SEB 6: G01: Sustainable & Smart Buildings**

Chair: Dr John Littlewood

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-040	Internal insulation of historic buildings: a stochastic approach to life-cycle costing within RIBuild EU project PhD Elisa Di Giuseppe, PhD Gabriele Bernardini, Prof. Marco D'orazio, Eng. Andrea Gianangeli, PhD Gianluca Maracchini
seb19f-042	Assessment of the efficiency and reliability of the district heating systems within different development scenarios Dr.sc.ing. Aleksandrs Zajacs, Mr. Raimonds Bogdanovics, Dr.sc.ing. Anatolijs Borodinecs
seb19f-045	Architects tactics to embed as-designed performance in the design process Dr Gabriela Zapata-lancaster
seb19f-069	Active Buildings in Practice Mrs Joanna Clarke, Mr Paul Jones, Dr John Littlewood, Professor Dave Worsely
seb19f-099	Building Performance Assessment Protocol for Timber Dwellings? Conducting Thermography Tests on Live Construction sites Dr John Littlewood, Ms Diana Wadron, Mr Francesco Zaccaro, Mr Gary Newman, Mr David Hedges
seb19f-102	Holistic Dwelling Energy Assessment Protocol for Mine-water District Heat Network Dr John Littlewood, Mr Nick Evans, Mr Paul Jones, Dr Bruce Philip, Mr Richard Radford, Mr A Whyman

**Friday 5 July****11.00-13:30, Jazmin 1****SEB 7: G01: Sustainable & Smart Buildings and IS02: Low-energy space cooling and ventilation: environmental, resilient and technological aspects**

Chair: Assist. Prof. Giacomo Chiesa

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-054	Automatic thresholding for sensor data gap detection using statistical approach PhD Student Houda Najeh, Professor Mohamed Naceur Abdelkrim, Associate Professor Karim Chabir, Professor Stéphane Ploix, Post Doctoral Mahendra Pratap Singh
seb19f-073	The impact of stakeholder preferences in multicriteria evaluation for the retrofitting of office buildings in Italy Student Giuseppe Pinto, Professor Alfonso Capozzoli, PhD Marco Piscitelli, Professor Laura Savoldi
seb19f-013	Passivhaus design for housing projects in Colombia Dr Vincenzo Costanzo, Mr Juan Esteban Carrillo Gomez, Dr Gianpiero Evola, Prof Luigi Marletta
seb19f-014	Earth-air Heat Exchanger Potential Under Future Climate Change Scenarios in Nine North American Cities Mr. Andrew Zajch, Dr. Giacomo Chiesa, Dr. William Gough
seb19f-055	How the position of a root-top one-sided wind tower affects its cross-ventilation effectiveness Miss. Mehrnoosh Ahmadi
seb19f-065	Climate adaptation of "Smart City" by assessing bioclimatic comfort for UBEM Dr. Ilya Dunichkin, Dr. Irina Ilina

Friday 5 July

11.00-13.00, Main Plenary

**SEB 8: IS04: Technologies for Renewable Energy**

Chair: Dr Nader Anani

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-001	Utilization of smart meter technology to increase energy awareness for residential buildings in Queensland, Australia Mr Olusola Akinsipe, Dr Prasad Kaparaju, Mr Domagoj Leskarac, Mr Diego Moya, Dr Sascha Stegen
seb19f-006	Solar Home System with Peak-Shaving Function and Smart Control in Hot Water Supply Professor Bin-Juine Huang, Graduate Student Zi-Ming Dong, Assistant Prof Po-Chien Hsu, Graduate Student Shen-Jie Sia, Graduate Student Jia-Wei Wang, Graduate Student Min-Han Wu
seb19f-053	Performance of Different PV Array Configurations Under Different Partial Shading Conditions Dr Nader Anani, Mr Haider Ibrahim
seb19f-074	Study of the Effect of Different Configurations of Bypass Diodes on the Performance of a PV String Dr Nader Anani, Mr Haider Ibrahim
seb19f-025	“Zukunftsquartiere”- On the path to Plus Energy Neighbourhoods in Vienna MSc. Jens Leibold, BSc. Nadja Bartlmä, MSc. Simon Schneider, MSc. Petra Schöffmann, PhD. MSc. Momir Tabakovic, Di Thomas Zelger
seb19f-039	Towards a near-zero energy landmark building using building integrated photovoltaics: the case of the Van Unnik building at Utrecht Science Park Prof.dr. Wilfried Van Sark, M.sc. Eelke Bontekoe

**Friday 5 July**

**11.00-13.00, Toboz1**

**SEB 9: IS08: Low-impact strategies and solutions in design and construction of the built environment**

Chair: Dr Mahmood Alam

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-005	Impact of Building Massing on Energy Efficient School Buildings Assoc.Prof. Yasemin Afacan, PhD Candidate Ali Ranjbar
seb19f-007	Factors influencing the use of reclaimed and recycled building materials in New Zealand Miss Zahra Balador, Dr. Morten Gjerde, Dr. Nigel Isaacs
seb19f-011	Laboratory tests of high performance thermal insulations Dr. Akos Lakatos, Dr. István Budai, Mr. Zsolt Kovács, Dr. Ákos Lakatos, Mr. Sándor Szanyi
seb19f-029	Use of an Object-Oriented System for Optimizing Life Cycle Embodied Energy and Life Cycle Material Cost of Shopping Centres Ms Kumudu Weththasinghe, Prof Valerie Francis, Dr André Stephan, Prof Piyush Tiwari
seb19f-035	Building Energy Simulation of Traditional Listed Dwellings in the UK: data sourcing for a base-case model Mrs Michela Menconi, Mr Noel Painting, Dr Poorang Piroozfar

Friday 5 July

11.00-13.00, Toboz 2

**SEB 10: IS13: Super Insulating Materials for Energy Efficient Buildings**

Chair: Dr. Stefano Fantucci

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-020	Standard based analysis of measurement uncertainty for the determination of thermal conductivity of super insulating materials M.Sc. Ing. Chiara Cucchi, Dr. Alice Lorenzati, Prof. Marco Perino, Dipl.-ing. Christoph Sprengard, Dr. Sebastian Tremel
seb19f-023	Field Experimental Study On Energy Performance Of Aerogel Glazings With Hollow Silica: Preliminary Results In Mid-Season Conditions Ph.D. Cinzia Buratti, Ph.D. Elisa Belloni, Ph.D. Francesca Merli, Ph.D. Elisa Moretti, Dr. Valentina Piermatti, Ph.d. Ihara Takeshi
seb19f-030	Hygrothermal characterization of high performance Aerogel-based internal plaster PhD Stefano Fantucci, Mr Marco Dutto, Mrs Elisa Fenoglio, PhD Valentina Marino, PhD Marco Perino, PhD Valentina Serra
seb19f-083	Studies on thermal performance of advanced aerogel based materials Dr. Juergen Frick, Prof. Harald Garrecht, Dr. Oliver Mielich, Dr. Marina Stipetic
seb19f-093	Experimental analysis of new aerogel based insulating building materials? hydrothermal performance in real weather conditions: full-scale application study Dr Timea Bejat, Mr Didier Therme
seb19s-015	Research on Aerogel-based renders Prof. Ines Flores-colen
seb19s-000	Superinsulation materials Dr Michal Ganobjak

**Friday 5 July**  
**15.30-17.30, Toboz 2**

**SEB 11: IS07: Urban form and microclimate: energy efficiency of the compact city**

Chair: Dr. Michele Morganti

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-008	Urban Energy Demand Modelling: A Statistical and Spatial Approach Using Various Urban Morphology Indicators Mrs Hung-chu Chen, Professor Bauke De Vries, Dr. Qi Han
seb19f-016	The relationship between the form of enclosed residential areas and microclimate in severe cold area of China Dr. Tingkai Yan, Pro. Hong Jin, Pro. Hua Zhao
seb19f-046	How much does it cost to go off-grid with renewables? A case study of a polygeneration system for a neighbourhood in Hermosillo, Mexico PhD. Cand. Moritz Wegener, Dr. Antonio Isalgué, PhD. Cand. Carlos Lopez Ordóñez, Dr. Anders Malmquist, Dr. Andrew Martin
seb19f-051	The role of thermal insulation in the architecture of hot desert climates MSc. Arch. Carlos López Ordóñez, PhD. Arch. Helena Coch Roura, PhD. Arch. Isabel Crespo Cabillo, PhD. Jaume Roset Calzada
seb19f-068	The correlation between urban morphology parameters and incident solar radiation performance to enhance pedestrian comfort, case study Jeddah, Saudi Arabia. Ms Badia Masoud, Professor Benoit Beckers, Professor Helena Coch
seb19f-047	Steps Towards an Optimal Building-Integrated Photovoltaics (BIPV) Value Chain in the Netherlands Mr. Ernst Van Der Poel, Ms. Yael Aartsma, Mr. Arthur De Vries, Mr. Erik Teunissen, Prof. Wilfried Van Sark, Ms. Ingrid Van Straten

Friday 5 July

15.30-17.30, Boroka 2

**SEB 12: IS09: Mitigation technologies to counter climate change and urban heat island effect and to improve comfort in urban environment**

Chair: Prof. Antonio Gagliano

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19f-036	Building insulating materials from agricultural by-products: A review Mr Matteo Vitale, Mr Santi Maria Cascone, Mr Stefano Cascone
seb19f-041	Process for the formulation of natural mortars based on the use of a new natural hydraulic binder PhDs. Eng. Nicoletta Tomasello, Prof. Santi Cascone, Arch. Giuseppe Longhitano, Eng. Renata Rapisarda
seb19f-056	Cool roofs with variable thermal insulation: UHI mitigation and energy savings in different Italian cities Prof Francesco Nocera, Eng. Stefano Cascone, Eng. Maurizio Detommaso, Prof Antonio Gagliano, Prof. Gaetano Sciuto
seb19f-067	Adaptive design to mitigate the effects of UHI: the case study of Piazza Togliatti in the Municipality of Scandicci. Prof. Rosa Romano, Arch. Mariavittoria Arnetoli, Prof. Roberto Bologna, Arch. Giulio Hasanaj
seb19f-072	Urban Climate and Health: two strictly connected topics in the History of Meteorology Associate Prof. Chiara Bertolin, Prof Dario Camuffo
seb19-088	Artificial Neural Network based controller for energy management in a Solar home in Algeria PhD Chekired Fathia, PhD Mahrane Achour, PhD Meflah Aissa, PhD Student Berkane Smain

**Friday 5 July**  
**15.30-17.30, Toboz1**

**SEB 13: Short Papers**

Chair: Prof. Fernanda Rodrigues

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19s-001	Implementation of Lighting Curation Platform Using Life-Log Data Graduate Student Jiyoung Seo, Post Doc. Researcher Younjoo Cho, Professor Anseop Choi, Post Doc. Researcher Yoonseok Hur, Graduate Student Heesu Lee
seb19s-003	Will local sensors offer the opportunity to track human behaviours in the households? Mr Shih-che Hsu, Dr Ian Hamilton, Dr Anna Mavrogianni, Dr Aidan O'sullivan
seb19s-006	Renovation of detached houses in Sweden: Can one-stop-shop provide a solution? PhD Candidate Georgios Pardalis, Doctor Mainali Brijesh, PhD Candidate Jalilzadehazhari Elaheh, Professor Krushna Mahapatra
seb19s-008	Simulation of an adsorption machine with auxiliary heater for CO <sub>2</sub> - neutral air conditioning of electric vehicles B. Eng. Lukas Wildner, Prof. Dr. Michael Walter, Prof. M. Sc. Stefan Weiherer
seb19s-009	Spectral analysis of a smart switchable polymer dispersed liquid crystal (PDLC) glazing for building application Mr. Abdulmohsin Hemaida, Dr. Aritra Ghosh, Prof. Tapas Mallick, Dr. Senthilarasu Sundaram

**Friday 5 July**

**15.30-17.30, Jazmin 1**

**SEB 14: Short Papers**

Chair: Prof Robert Howlett

<b>PROSE Paper No</b>	<b>Paper Title / Authors</b>
seb19s-010	Cultural Wagon Summary Architect Pablo Gonzalez, Architect Soledad Cormick, Architect Lucas Daher, Architect Ana Lucia Rodriguez, Architect Edgardo Suarez
seb19s-011	Sustainable Housing Solutions Summary Architect Pablo Gonzalez, Architect Soledad Cormick, Architect Lucas Daher, Architect Ana Lucia Rodriguez, Architect Edgardo Suarez
seb19s-014	Investigating the application of LEED and BREEAM certification schemes for buildings in Kazakhstan Dr Serik Tokbolat
seb19s-005	Climate Change Adaptation: Microalgae Curtainwall Architecture Dr. Kyoung Hee Kim



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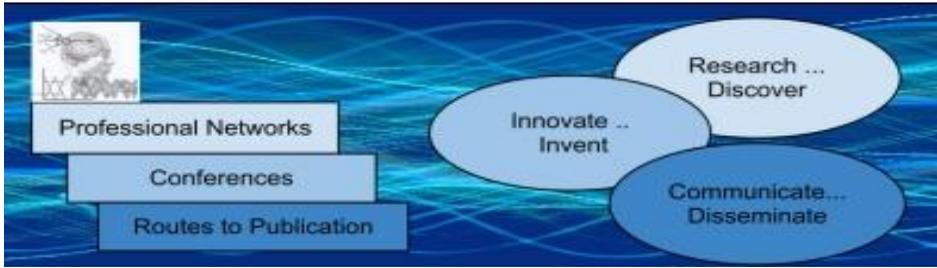
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PO Box 243

Selby

YO8 1DS

United Kingdom

**Web Site:** <http://www.kesinternational.org>

**Email:** [enquiry@kesinternational.org](mailto:enquiry@kesinternational.org)

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