



Europe and the Mediterranean Towards a Sustainable Built Environment

An International Conference organised by

SBE Malta (Sustainable Built Environment Malta) iiSBE Malta Chapter



in collaboration with the University of Malta, Ministry for Resources, the Environment and Climate Change and the support of the Building Industry Consultative Council, Malta.



Valletta, Malta

16TH – 18TH MARCH 2016

INTRODUCTION

EUROPE & THE MEDITERRANEAN – TOWARDS A SUSTAINABLE BUILT ENVIRONMENT

Hall 1 – 9.00-9.30

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| S1.1 | SBE (Sustainable Built Environment) iiSBE Chapter Malta | Ruben Paul Borg, <i>President SBE Malta, Chairman SBE 16 Malta Scientific Committee</i> | |
| S1.2 | iiSBE (International Initiative for a Sustainable Built Environment), SBE 16 International Conference Series | Nils Larsson, Chairman iiSBE | |
| S1.2 | COST – Malta Council for Science and Technology (MCST) | Janet Mifsud, <i>COST Coordinator, Malta</i> | |
| S1.3 | Faculty for the Built Environment, University of Malta | Alex Torpiano, <i>Dean, Faculty for the Built Environment</i> | |
| S1.4 | Building Industry Consultative Council (BICC) | Charles Buhagiar, <i>Chairman BICC</i> | |
| S1.5 | Ministry for Resources, the Environment and Climate Change | Leo Brincat, <i>Minister for Resources, the Environment and Climate Change</i> | |

PLENARY SESSION A

SUSTAINABLE BUILT ENVIRONMENT – MATERIALS & STRUCTURES

Hall 1 – 9.30-10.30

Chair: Dr. Ruben Paul Borg
Rapporteur: Diane-Marie Sammut

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| A1 | Current Status of Climate Change and Scenarios for Action | Nils Larsson | |
| A2 | Introducing the Portuguese Sustainability Assessment Tool for Urban Areas: SBTool PT – Urban Planning | Luis Braganca <i>President of iiSBE</i> and Erika Guimaraes | |
| A3 | Concrete Structures for a Sustainable and Resilient Built Environment | Petr Hajek | |
| A4 | “Hong Kong’s Campaign for Sustainable Built Environment - Revitalisation of old Industrial Buildings” | Cheung Hau-wai, <i>Chairman of the Hong Kong Green Building Council</i> | |

SESSION 1
MATERIALS & STRUCTURES A
Hall 1 – 11.00-12.30

Chair: Prof. Petr Hajek
Rapporteur: Niki Brincat

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| 1.1 | Influence of Recycled Sand and Gravel on the Rheological and Mechanical Characteristics of Concrete | Zine-el -abidine Tahar, El-Hadj Kadri, Tien-Tung Ngo and Adrien Bouvet | |
| 1.2 | Effect of Silica Fume on Concrete Strength | Ali Mansor, Ahmed Hamed and Ruben Paul Borg | |
| 1.3 | High Performance Foam Concrete Produced in Turbulence Mixers | Genadijs Šahmenko , Aleksandrs Korjamins and Eva Namsone | |
| 1.4 | Effect of Fine Clay Brick Waste on Self-compacting Concrete Properties | Ali Mansor, Ahmed Hamed & Ruben Paul Borg | |
| 1.5 | Possibilities of Redevelopment of Embankment Dams by Suitable Grouting Mixtures (JG – This does not read well. Maybe delete the word ‘grouting?’ | Rostislav Drochytka and Magdaléna Kociánová | |
| 1.6 | Steel Jacketing of RC Columns: Reliability of Capacity Laws for Concrete | Liborio Cavaleri, Fabio Di Trapani and Marco Filippo Ferrotto | |
| 1.7 | Seismic Vulnerability and Fragility of Industrial Steel Buildings affected by the Emilia-Romagna Earthquake | Antonio Formisano, Carmine Castaldo and Ida Iannuzzi | |

SESSION 2
SUSTAINABLE DEVELOPMENT AND SPATIAL PLANNING
Hall 1 – 13.30-15.30

Chair: Prof. Roko Zarnic
Rapporteur: Dr. Paul Gauci

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| 2.1 | The Regulatory Framework in Urban Biogas Plants to Define New Steps for a Common Development of Regulatory Guidelines in EU Member States | Alessandro Pracucci, Giacomo Bizzarri and Theo Zaffagnini | |
| 2.2 | “Evaluation of Vegetation in Urban Space” Barcelona Base Model Proposed to the Dominican Republic. | Gilkauris María Rojas Cortoreal, Jaume Roset, Francesc Navés, Carlos López Ordóñez and Jernej Vidmar, | |
| 2.3 | Sustainable Use of Heritage Resources | Joseph Falzon | |

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| 2.4 | Sustainable Strategies for Promoting the Horezu Pottery and the Cultural Landscape of Horezu, Romania | Smaranda Maria Bica and Elena Roxana Florescu | |
| 2.5 | Kenzo's Master Plan After the Earthquake - a Base for Regenerative Development of Skopje | Strahinja Trpevski | |
| 2.6 | Depopulation in Rural Towns of Sicily: A Historical-to-Present Day Analysis | Agatino Rizzo | |
| 2.7 | How Should We Deal with Socio-Economic Values in Development Decisions? | Chris E. Cloete | |
| 2.8 | Sustainable Mobility, Livability and Public Space in Historic Village Cores – a Case Study of Lija, Malta | Maria Attard, Alberto Miceli Farrugia, Jacques Borg Barthet | |
| 2.9 | Sustainability in Development Planning | Vincent Grech | |

INTRODUCTION

EUROPE & THE MEDITERRANEAN – TOWARDS A SUSTAINABLE BUILT ENVIRONMENT

Hall 1 – 9.00-9.30

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| S2.1 | Sustainable Built Environment Malta | Ruben Paul Borg | |
| S2.3 | Sustainable Built Environment Malta | Paul Gauci | |
| S2.4 | Sustainable Built Environment Malta | Cyril Spiteri Staines | |

PLENARY SESSION B

RENEWABLE ENERGY – MATERIALS & STRUCTURES

Hall 1 – 9.30-10.30

Chair: Prof. Cyril Spiteri Staines

Rapporteur: Niki Brincat

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| B1 | Wind Energy Technology Reconsideration to Enhance the Concept of Smart Cities (Horizon 2020 TU1304 COST Action, WINERCOST) | Charalampos Baniotopolous | |
| B2 | Offshore wind turbines: from fixed-bottom to floating technologies | Claudio Borri, A. Giusti, E. Marino, G. Stabile | |
| B3 | Composites: A Sustainable Alternative Repair and Rehabilitation System for Ageing Infrastructure | Ayman Soliman Mosallam | |
| B4 | Quality Specifications for Roadway Bridges: Standardization at a European Level (TU1406 COST ACTION - BridgeSpec) | Jose C. Matos | |

SESSION 3

Sustainable Strategies for Cultural Heritage

Hall 1 – 11.00-12.30

Chair: Prof. Thomas Lutzkendorf

Rapporteur: Etienne Fenech

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| 3.1 | Roadmap for IT Research on a Heritage-BIM Inter-operable Platform within INCEPTION | Peter Bonsma, Iveta Bonsma, Rizal Sebastian, Anna Elisabetta Ziri, Silvia Parenti, Pedro Martín Leronés, Jose Llamas, Federica Maietti, Beatrice Turillazzi | |
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| | | and Ernesto Iadanza | |
| 3.2 | Common Strategies and Avant-garde Approaches in Terrestrial Laserscanning | Daniel Blersch, Christoph Held, M. Mettenleiter, Christoph Fröhlich and Marinos Ioannides | |
| 3.3 | Digital Documentation: Sustainable Strategies for Cultural Heritage Assessment and Inspection | Federica Maietti, Emanuele Piaia and Beatrice Turillazzi | |
| 3.4 | Diagnostic Integrated Procedures aimed at Monitoring, Enhancement and Conservation of Cultural Heritage Sites | Federica Maietti, Emanuele Piaia and Silvia Brunoro | |
| 3.5 | 3D Integrated Laser Scanner Survey and Modelling for Accessing and Understanding European Cultural Assets | Federica Maietti, Federico Ferrari, Marco Medici and Marcello Balzani | |
| 3.6 | Risks and Resilience of Cultural Heritage Assets | Vlatka Rajcic and Roko Zarnic | |
| 3.7 | The Contribution of GIS for the Sustainable Protection of Monuments: The Case of Erimokastro and Earantapixo Acropolis in Rhodes, Greece | Elisavet Tsilimantou, Eleni Oikonomopoulou, Ekaterini Delegou, Charalambos Ioannidis, Jonas Sagias and Antonia Moropoulou | |

SESSION 4

MATERIALS & STRUCTURES B

Hall 1 – 13.30-15.00

Chair: Prof. Rostislav Drochytka

Rapporteur: Lara Mifsud

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| 4.1 | The Hidden Value of Stone: Life Cycle Assessment of the Construction and Refurbishment of a 60-year-old Residential Stone Building | Dimitra Ioannidou, Spyridon Daglas, Gerasimos Kallivokas, Maria Ploumaki, Stefano Zerbi and Guillaume Habert | |
| 4.2 | Structural Optimization Including Whole Life Cost of a Timber Building using Evolutionary Algorithms | Georgios K. Bekas and Georgios E. Stavroulakis | |
| 4.3 | Innovative and Traditional Techniques for Seismic Retrofitting of an Existing RC School Building: Life Cycle Assessment and Performance Ranking through MCDM Methods | Antonio Formisano, Carmine Castaldo, Nicola Chieffo and | |

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| | | Giovanni Chiumiento | |
| 4.4 | The Use of Advanced Materials for Energy Efficiency at the ZEB Living LAB in Trondheim. Environmental Performance vs. Environmental Impact. | Luca Finocchiaro and Roberta Ramaci | |
| 4.5 | Fiber Reinforced Polymers Textiles for Strengthening Historical Buildings and Examples for Use in Italian and Maltese Heritage | Michelangelo Micheloni | |
| 4.6 | A Study on Moisture Movement within Traditional and Contemporary Building Materials | Nadia Martinelli | |
| 4.7 | Waste Minimisation: a Design Review | Nicolette Micallef | |
| 4.8 | Eco Build – Sustainable Materials. | Ivan Bartolo, Ruben Paul Borg | |

SESSION 5

Industrial Case Studies A

Hall 1 – 15.00-15.30

Chair: Prof. Jean-Marie Hauglustaine

Rapporteur: Dr. Paul Gauci

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| 5.1 | Composite Insulating Panel Construction: EVG 3D System, University of Malta Project. | Ayman Soliman Mosallam, Ruben Paul Borg and Andrew Psaila | |
| 5.2 | Start-Up Projects - University of Malta | Martina Pace | |
| 5.3 | The LifeMedGreenRoof Project, University of Malta | Antoine Gatt | |

SESSION 6

Building Energy Performance A

Hall 1 – 16.00-17.30

Chair: Prof. Luca Finocchiaro

Rapporteur: Diane-Marie Sammut

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| 6.1 | The Contribution of Energy Performance Certificates to Resource Savings and Environmental Protection - Lessons from Germany | Thomas Lützkendorf, Peter Michl and David Lorenz | |
| 6.2 | Introduction of Sociology-inspired Parameters in the Energy Performance Certification Calculation Method | Stephane Monfils and Jean-Marie Hauglustaine | |
| 6.3 | A Fuzzy Control System For Energy Management in a Domestic Environment | Vincenzo Bonaiuto, Stefano Bifaretti, Luca Federici, Sabino Pipolo and Fausto Sargeni | |
| 6.4 | Performance Monitoring of Energy Efficient Retrofits – 4 Case Study Properties in Northern Ireland. | Teresa Mcgrath, Sreejith V. Nanukuttan, PAM Basheer and Siobhan Brown | |

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| 6.5 | The Proper Design of Façade Openings for Occupant Satisfaction: Variance Based Sensitivity Analysis and Optimization of Model Output | Rossano Albatici, Roberto Covi and Alessia Gadotti | |
| 6.6 | Towards Sustainable Architecture: Lessons from the Vernacular. Case Study - the Traditional Houses of the Asir Province of Saudi Arabia. | Joseph Galea | |

INTRODUCTION

EUROPE & THE MEDITERRANEAN – TOWARDS A SUSTAINABLE BUILT ENVIRONMENT

Hall 1 – 9.00-9.30

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|------|---|-----------------|--|
| S3.1 | Sustainable Built Environment Malta | Ruben Paul Borg | |
| S2.2 | COP 21, Buildings Day and the Global Alliance on Buildings and Construction | Nils Larsson | |
| S3.2 | Minister for Resources, the Environment and Climate Change | Leo Brincat | |
| S3.3 | European Commissioner for the Environment | Karmenu Vella | |

PLENARY SESSION C

CULTURAL HERITAGE - SUSTAINABLE DEVELOPMENT

Hall 1 – 9.30-10.30

Chair: Dr. Paul Gauci

Rapporteur: Diane-Marie Sammut

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| C1 | Cultural Heritage Research Trends in Europe | Roko Zarnic | |
| C2 | Towards Sustainable access, Enjoyment and Understanding of Cultural Heritage and Historic Settings | Roberto Di Giulio | |
| C3 | The holistic e-Documentation of the Past: Risks and Challenges (Horizon 2020, INCEPTION) | Marinos Ioannides | |

SESSION 7

RENEWABLE ENERGY Sources

Hall 1 – 11.00-12.30

Chairs: Prof. Roberto di Giulio

Rapporteur: Etienne Fenech

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| 7.1 | Variable Winds and Aerodynamic Losses of Transport Systems: A New Wind Energy Technology for Future Smart Cities | Tommaso Morbiato, Claudio Borri and Simone Salvadori | |
| 7.2 | Wind Energy Potential in Venturi-shaped Roof Constructions | Bert Blocken, Twan van Hooff, Lourens Aanen and Ben Bronsema | |
| 7.3 | The Effect of Pitch Angle on the Performance of a Vertical-Axis Wind Turbine | Abdolrahim Rezaeiha, Ivo Kalkman and Bert Blocken | |
| 7.4 | On the Understanding of the Above Roof Flow of a High-rise Building for Wind Energy Generation | Hassan Hemida | |
| 7.5 | Monitoring Based Identification for Structural Life Cycle | Rüdiger Höffer, | |

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| | Management of Wind Energy Converters | Simon Tewolde, Simona Bogoevska, Matthias Baitsch, Sven Zimmermann and Gabriele Barbanti | |
| 7.6 | Design and Construction of a Small Multi-Bladed Wind Turbine for the Suburban and Rural Environments | Martin Muscat, Tonio Sant, Robert Farrugia, Cedric Caruana and Redeemer Axisa | |
| 7.7 | Reduction of Current Harmonics in Grid-Connected PV Inverters using Harmonic Compensation - Conforming to IEEE and IEC Standards | Daniel Zammit, Cyril Spiteri Staines and Morris Apap | |

SESSION 8 Building Energy Performance B

Hall 1 – 13.30-15.00

Chair: Prof. Luis Braganca

Rapporteur: Prof. Cyril Spiteri Staines

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| 8.1 | Retrofit Opportunities for the Historical Back Bay Neighbourhood | Ornella Iorio, Antonino Barbalace, John Fernandez | |
| 8.2 | Thermal Conductivity of an Unplanted Sustainable Green Roof System | Christina Said, Paul Refalo, Luciano Mule Stagno and Charles Yousif | |
| 8.3 | The Effect of Different Glazing Apertures on the Thermal Performance of Maltese Buildings | Trevor F. Caruana and Charles Yousif | |
| 8.4 | Occupant Behaviour at the Presidential Palace of San Anton, Malta: A Study Supporting the Development of a Methodology to Enhance Energy Efficiency in Heritage Buildings | Amber Wismayer, Carolyn Hayles and M. Lawrence, N. McCullen and Vince Buhagiar | |
| 8.5 | Renovating Primary School Buildings in Malta to Achieve Cost-optimal Energy Performance and Comfort Levels | Damien Gatt and Charles Yousif | |

SESSION 9

Industrial Case Studies B

Hall 1 – 15.00-15.30

Chair: Prof. Rossano Albatici

Rapporteur: Niki Brincat

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| 9.1 | Fiber Reinforced Polymers Textiles | Michelangelo Micheloni | |
| 9.2 | Lightweight Aerated Concrete | Keith Pace | |