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Chair's Welcome Message

Welcome

The Sixth International Conference on Sustainability and Energy in Buildings 2014 (SEB14) was a major international conference organised by a partnership made up of KES International and the Ecological Built Environment Research and Enterprise group in Cardiff School of Art & Design from Cardiff Metropolitan University, UK.

There is a turning point on the horizon as the supply of energy becomes less reliable and more expensive, which is having a major influence on the design, optimisation, performance measurements running and preservation of: buildings, neighbourhoods, cities, regions, countries and continents and the people who occupy and use these buildings and resources. The source and nature of energy, the security of supply and the equity of distribution, the environmental impact of its supply and utilization, are all crucial matters to be addressed by suppliers, consumers, governments, industry, academia, and financial institutions.

SEB-14 invites participation and paper submissions across a broad range of sustainability and energy related topics relevant to the main theme of Sustainability in Energy and Buildings. Applicable areas included sustainable design and of buildings, neighbourhoods and cities (built and natural environment); modelling, monitoring and optimisation techniques; smart energy systems for smart cities; green information communications technology; and well as a broad range of solar, wind, wave and other renewable energy topics.

The aim of the conference is 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 will be an exciting chance to present, interact, and learn about the latest research in Sustainability in Energy and Buildings.

In addition to presentations of full and short papers in general tracks and invited session tracks, SEB-14 also included expert keynote talks and doctoral student poster sessions.

The conference featured four General Tracks:-

- Sustainable Buildings
- Smart Energy Systems and Optimisation
- Renewable Energy Technologies and Integration with the Built and Natural Environment
- Computing and Intelligent Communications Technology for Sustainability

In addition there were 13 Special Sessions.

The conference attracted submissions from around the world. Submissions for the Full-Paper Track were subjected to a two-stage blind peer-review process. With the objective of producing a high-quality conference, only the best of these were selected for presentation at the conference and publication in the Elsevier Procedia Energy proceedings. Submissions for the Short Paper Track and Poster abstract were subjected to a 'lighter-touch' review and published in an online medium.

Thanks are due to the very many people who have given their time and goodwill freely to make SEB-14 a success. We are grateful to Cardiff Metropolitan University and UCL for its valued support for the conference. We would like to thank the members of the International Programme Committee who were essential in providing their reviews of the conference papers, ensuring appropriate quality. 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 will enjoy the conference and find the proceedings an interesting, informative and useful resource for your research.

SEB-14 Chairs and Organising Committee

Organisation

Honorary Chair

Prof. Ray Cole

University of British Columbia, Canada

General Chairs

Dr John Littlewood

Cardiff Metropolitan University, Wales, UK

Dr. Catalina Spataru

UCL Energy Institute, UK

Executive Chair

Professor Robert J. Howlett

Executive Chair, KES International &
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Publicity Chairs

Prof. Andrew Geens CIBSE, UK

Prof. George Karani Cardiff Metropolitan University, UK

Mr Jon Moorhouse University of Huddersfield, UK

Chairs of the Doctoral Track

Mr. Jon Cosgrove Cardiff Metropolitan University, Wales, UK

Ms. Stephanie Gauthier University College London, UK

KES International

SEB-14 is a part of the Sustainability in Energy and Buildings conference series run by KES International.

Previous conferences

SEB-09: Brighton, UK

SEB-10: Brighton, UK

SEB-11: Marseilles, France

SEB-12: Stockholm, Sweden

MGEF-13: Fes, Morocco

International Programme Committee

Name	Affiliation
Dr. Mohamed Abbas	UDES, Bou Ismail, Algéria
Dr. Chérifa Abid-David	Aix-Marseille University, IUSTI Lab
Prof. Vivek Agarwal	Indian Institute of Technology, Bombay, India
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Dr. Mahieddine Emziane	Masdar Institute of Science and Technology, Abu Dhabi

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Dr. Jonathan Gates	University of Brighton, UK
Stephanie Gauthier	University College London, UK
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Prof. Steve Goodhew	University of Plymouth, UK
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Prof. A. El Hajjaji	University of Picardie Jules Verne, France
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Prof. Ian Knight	Welsh School of Architecture, Cardiff University, UK
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Prof. Sumathy Krishnan	North Dakota State University, USA
Dr. John Littlewood	Cardiff Metropolitan University, UK
Prof. Søren Linderøth	DTU Energy Conversion, Technical University of Denmark
Prof. Dr. Bruno Marques	University Lusíada Porto
Barry Marsh	BRE National Solar Centre, Cornwall

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Prof. Giuliano C. Premier	University of South Wales
Dr. Abdelhamid Rabhi	University of Picardie Jules Verne, Amiens in France
Prof. Ahmed Rachid	University of Picardie Jules Verne
Dr. Jonathan Radcliffe	Centre for Low Carbon Futures, Birmingham, UK
Dr Eric Robert	URS Infrastructure & Environment UK Limited, Cambridge
Dr. Atul Sagade	New Satara College of Engineering and Management, India
Dr. Wilfried G.J.H.M. van Sark	Utrecht University, Netherlands
Prof. Begum Sertyesilisik	Liverpool John Moores University, UK & Istanbul Technical University, Turkey
Dr. Magda Sibley	The University of Manchester, UK
Ivan Smallwood	Sustainable Construction Monitoring & Research Ltd, Cardiff, UK
Dr. Catalina Spataru	UCL Energy Institute, UK
Prof. Fionn Stevenson	Sheffield School of Architecture, The University of Sheffield, UK
Prof. Fernando Tadeo	University of Valladolid, Spain
Dr. Ali Tahri	University of Science and Technology of Oran USTO-MB, Algeria
Prof. Dr. Horia-Nicolai Teodorescu	Technical University of Iasi, ROMANIA
Prof. Giuseppe M. Tina	DIEEI - University of Catania, Italy

Name	Affiliation
Linda Toledo	Institute of Energy and Sustainable Development - De Montfort University, UK
Prof. Christopher Tweed	Centre for Sustainable Design of the Built Environment, Welsh School of Architecture, Cardiff University, UK
Dr. Humberto Varum	University of Aveiro, Portugal
Dr. Simon Walters	University of Brighton, UK
Prof. Norman Wienand	Sheffield Hallam University, UK
Professor Pieter de Wilde	University of Plymouth, UK
Prof. Hong-Xing Yang	Hong Kong Polytechnic University, China
Assist. Prof. Geun Young Yun	Kyung Hee University, South Korea
Prof. Wim Zeiler	TU Eindhoven, Faculty of the Built Environment

Keynote Speakers

Professor Raimund Bleischwitz

University College London, UK

The Role of Resource Efficiency for Sustainable Construction

Abstract: The contribution looks at resource efficiency from both an environmental and socio-economic perspective. It deals with environmental concepts such as the 'planetary boundaries' and land use changes from the recent UNEP IRP report as well as with development perspectives for resource-rich countries. It articulates a vision where less primary materials are being used in the 2nd half of the 21 century, however with strong features of a circular economy for non-renewable resources and extraction pathways for a number of countries. While resource efficiency and eco-innovation feature high on such agenda, there is also a scope for policies. The contribution reflects on the need to overcome barriers and elaborates on policy pillars with a particular focus on the EU. Those policy pillars stem from the resource efficiency roadmap and ongoing discussions in a number of EU projects as well as from other observations; they cover economic incentives and legal mechanisms.



Biography: Raimund Bleischwitz has joined University College London (UCL ISR) as BHP Billiton Chair in Sustainable Global Resources in August 2013; at UCL he'll establish the new Institute for Sustainable Resources with Paul Ekins.

He was previously Co-Director on 'Material Flows and Resource Management' at the Wuppertal Institute in Germany, and has been Visiting Professor at the College of Europe in Bruges, Belgium since 2003.

An economist by training (PhD, 'Habilitation'), he has more than twenty years experience in research on environmental and resource economics, resource efficiency, incentive systems and policies, raw material conflicts, industry and sustainability. Raimund spent fellowships at Johns Hopkins University (AICGS) and at the Transatlantic Academy (TA), both in Washington DC, and in Japan.

Raimund has more than 230 publications, inter alia the report on The Global Resource Nexus (with five fellows from the TA), and the books International Economics of Resource Efficiency. Eco-Innovation Policies for a Green Economy (Springer Publisher 2011), Sustainable Resource Management. Trends, Visions and Policies for Europe and the World (Greenleaf Publisher 2009), Sustainable Growth and Resource Productivity - Economic and Global Policy Issues (Greenleaf Publisher 2009), Corporate Governance of Sustainability: A Co-Evolutionary View on Resource Management (Edward Elgar

Publisher 2007), Eco-Efficiency, Regulation, and Sustainable Business. Towards a Governance Structure for Sustainable Development (Edward Elgar Publisher 2004).

Professor Raymond Cole

University of British Columbia, Canada

Shifting Performance Expectations: Net Positive and Regenerative

Abstract: Two key significant shifts in thinking have occurred over the past decade that have begun to reframe building environmental performance. First, whereas "net zero" has become an increasingly explicit performance goal and increasingly embedded in national energy policies, the emerging notion of "net positive" buildings which, if considered as more than simply the generation of more exporting energy versus its importation to individual buildings or the grid, shifts the emphasis to the maximization of energy performance in a system-based approach. Second, whereas green building strategies, performance goals, and associated assessment methods emphasize the ways and extent that buildings should mitigate global and local resource depletion and environmental degradation, the emerging notion of 'regenerative' design emphasizes a co-evolutionary, partnered relationship between humans and the natural environment, rather than a managerial one that builds, rather than diminishes, social and natural capital.

This presentation evaluates regenerative design, net positive approaches and the resulting consequences of viewing the role of a building in adding value to its context and systems in which it is part. Such a shift opens a host of new technical, behavioural, policy and regulatory issues and opportunities not currently evident with green building and net zero approaches.



Biography: Dr Ray Cole is Professor and former Director of the School of Architecture and Landscape Architecture, where he has been teaching environmental issues in building design for more than 35 years. His current research interests relate to regenerative design, building environmental performance assessment, and human and automated intelligence.

Ray was selected as a North American Association of Collegiate Schools of Architecture Distinguished Professor for "sustained commitment to building environmental research and teaching" in 2001. In 2003 he received the US Green Building Council's Green Public Service Leadership Award. Ray was the recipient of the 2008 Sustainable Buildings Canada Life-Time Achievement Award and the 2009 Canada Green Building Council's Life-Time Leadership Award. He is a past Director member of the Canadian Green Building Council, an honorary member of the Architectural Institute of BC, Fellow of the Royal Architectural Institute of Canada and holds the UBC designation of Distinguished University Scholar.

Dr Jarmila Davies

Welsh Government, UK

Is knowledge sharing a sustainable concept in the increasingly constrained economic context?

Abstract: Collaborative R&D plays significant role in stimulating enterprise and innovation in both academic and business sectors. Open innovation concept encourages this activity, however in many cases diverse cultures of both sectors make it difficult to form successful partnership. The importance of generating new knowledge has been recognized by many generations as engine for growth and prosperity and Government policy underpinned by associated funding encourages development of closer links between academia and industry.

This presentation raises important questions about sustainability of knowledge sharing in ever increasing quest for profit within increasingly constrained economic context.



Biography: Dr Jarmila Davies CEng is an Academia Engagement Senior Manager of the Welsh Government. Having graduated in Civil and Structural Engineering at Prague University Jarmila pursued a successful career in higher education at the university where she led research programmes of international standing. Being Chartered Civil and Structural Engineer, she gained considerable experience of collaboration projects working with the construction, manufacturing and engineering industries including a broad range of SME's in Wales.

Jarmila has played prominent roles in the development of lifelong learning programmes for Welsh engineers and the promotion of the public understanding of science and engineering.

She is a founding chair of Women into Science and Engineering (WISE) in Wales, served as a Honorary President of Women in Education Network and as President of the South Wales Institute of Engineers - the first woman president in the Institute's 150 years history.

Jarmila is a Fellow of the Institution of Civil Engineers, a Member of the European Federation of Engineering Associations, Honorary Fellow of the Chamber of Czech Engineers and a founding member and Fellow of the Institute of Knowledge Transfer. She serves on several Boards and committees concerned with knowledge sharing agenda, education and promoting the public understanding of science and engineering.

She is committed to establishing new forms of interface between businesses and academic institutions and developing relationship and knowledge management as vital tools in the knowledge sharing process.

Adrian Leaman

Building Use Studies / Usable Buildings Trust, UK

The Responsible Retrofit Guidance Wheel: accessible research results for everyone

Abstract: One of the most pressing problems in improving building performance is how to disseminate research findings to a wider audience, especially those like designers and building owners whose first port of call for trusted information is not usually from academic sources. The Responsible Retrofit Guidance Wheel is a web-browser-based approach which helps both the casual, inquisitive user and the seasoned building professional obtain guidance on the possible consequences of retrofit interventions. The Wheel uses some of the newer web browser support software. It is intended to be user friendly, authoritative and simple to update. The project was initiated by the Sustainable Traditional Buildings Alliance (STBA) following on from their report "The Responsible Retrofit for Traditional Buildings" published in September 2012 and funded by the Department of Energy and Climate Change (DECC). This presentation will examine some of the thinking behind the Wheel, within the wider context of how best to communicate research results to a wider audience. Delegates will also be able to examine the Wheel for themselves in a separate session. www.responsible-retrofit.org/greenwheel/



Biography: Adrian Leaman is principal of Building Use Studies and co-founder of the Usable Buildings Trust. He specialises in building performance studies from the building users' point of view. His work in this area includes space syntax (1970s) 'sick' building studies (1980s), workplace studies (1990s), the Probe series of building performance studies (1995-2002), development of the BUS methodology survey (1985 onwards). He has over 160 publications, many of which are available, along with past presentations, on the charitable website www.usablebuildings.co.uk

Dr Marco Perino

Politecnico di Torino, Italy

The building envelope: a future beyond the concept of thermal insulation

Abstract: The key role of the building envelope in building energy efficiency and indoor comfort for users has long been established. Nevertheless, until recent times, all efforts and attention have mainly been focused on increasing and optimizing the thermal insulation of the envelope components.

This strategy was a winning approach for a long time, but its limitations became obvious when users and designers started to consider the overall energy demand of a building (that is, for heating, cooling and lighting) and to aim for Zero Energy Building (ZEB) or nearly ZEB goals.

It soon became clear that new and more revolutionary concepts and technologies, which could further improve the energy efficiency of buildings, needed to be developed. The potential benefits of such technologies and concepts are relevant since the building envelope is of paramount importance in controlling the energy and mass flows from outdoors to indoors (and vice versa) and, moreover, the facades offer a significant opportunity for solar energy exploitation.

Several researches (e.g. IEA-ECBCS Annex 44) have demonstrated that the limitation of the existing technologies could be overcome only by switching from a "static" system to "responsive" and "dynamic" components, such as Multifunctional Facade Modules (MFMs) and Responsive Building Elements (RBE). These components are able to continuously and pro-actively react to outdoor and indoor environment conditions and facilitate and enhance the exploitation of renewable and low exergy sources.

In order to reduce the energy demand, to maximize the indoor comfort conditions and to produce energy at the site, these almost "self-sufficient" or, even, "positive energy" building skins frequently incorporate different technologies (e.g. ventilation systems, decentralized heating/cooling units, heat exchangers, energy supply devices, energy storage, lighting equipments, shading devices, ventilated cavities, energy converters, etc.) and are functionally connected to other building services and installations.

An overview of the technological evolution of the building envelope that has taken place, ranging from traditional components to the innovative skins, will be given in the presentation, while focusing on the different approaches that have characterized this development.

Examples of innovative solutions for responsive and dynamic components and the future trends of development will be described. The potential benefits will be analyzed and contrasted with the challenges posed by these new technologies, namely how to design such components and how to test and study their thermal and energy performances.

The weakness of the present day technologies, as well as the limitation of the available analysis tools and standards will be highlighted and ideas about the desirable future research and development activities will be outlined.

Finally, the most relevant results of a decade-long research activity (numerical and experimental studies) carried out on various active and integrated building envelope components, will be presented.



Biography: Dr. Marco Perino graduated in Mechanical Engineering and obtained a PhD in Energy Technologies at the Politecnico di Torino. He is a Professor at the Politecnico di Torino, where he has been taught thermal and HVAC systems, building physics, applied thermodynamics and heat transfer for more than 20 years.

In the early years of his career, his research activity was related to small power heat appliances and combustion analysis, IAQ and pollutant dispersion inside confined spaces, air distribution and ventilation systems.

More recently, his research interests have been focused on indoor environment control in museums and historical buildings, the thermo fluid dynamic analysis of traditional and innovative building envelope components, multifunctional facade modules and low exergy HVAC systems, with special emphasis on solar systems that make use of slurry PCM.

Since the mid nineties, he has been active in various research groups of the International Energy Agency (IEA - EBC, Energy Conservation in Building implementing agreement). He has participated in the World Health Organization work group created to draft guidelines for the use of natural ventilation for infection control in health care settings.

He was a member of the technical committee for the design of the showcase for Leonardo da Vinci's self-portrait and for the environmental monitoring during the temporary "Leonardo, il genio, il mito" exhibition at "La Reggia della Venaria Reale" (Turin, Italy, 2011).

Marco Perino has been responsible for more than 30 research/consultancy contracts of the Department of Energy at the Politecnico di Torino and research projects financed by the Italian Ministry of Education, Regional Authorities and the European Commission.

He is a member of the Scientific Committee of the following conferences: AIVC - Air Infiltration and Ventilation Conference, RoomVent, IAQVEC, Indoor Air, IBPC - International Building Physics Conference, BEPH - The Fifth International Workshop on Energy and Environment of Residential Buildings, Clima 2013 and Building Simulation.

He is a reviewer for some of the most relevant international journals in the sector, e.g.: Applied Energy, Applied Thermal Engineering, Architectural Science Review, Building and Environment, Energy and Building, International Journal of Power and Energy, Journal of HVAC&R Research, Journal of Building Performance Simulation,

Journal of Green Buildings, Materials, Sustainability, The International Journal of Ventilation.

Marco Perino will be the chairman of the next International Building Physics Conference, which will be held in Torino in June 2015. He is a member of AICARR (Italian Chapter of the ASHRAE Society), ASHRAE and ISIAQ (International Society of Indoor Air Quality).

His research activity is summarized in more than 160 scientific papers published in national and international conference proceedings, as well as national and international journals and books.

Conference Schedule

Wednesday 25 June 2014

Early Registration Welcome Drinks Reception Mercure Holland House Hotel and Spa	18.30 Early Registration Opens 19.00 Talk by Adrian Leaman, Building Use Studies / Usable Buildings Trust: "The Responsible Retrofit Guidance Wheel: accessible research results for everyone" 19.45 Drinks Served 21.00 Finish
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Conference Schedule

Thursday
26 June 2014

8:00	Registration	
9:00	Conference Opening Ceremony Caernarfon Room	<p>Professor David Brooksbank <i>Pro Vice-Chancellor (Enterprise) & Dean, Cardiff School of Management, Cardiff Metropolitan University</i></p> <p>Peter Davies <i>Wales Commissioner for Sustainable Futures</i></p> <p>Professor Robert Howlett <i>Executive Chair, KES International</i></p> <p>Dr John Littlewood <i>SEB-14 Chair, Cardiff Metropolitan University</i></p>
9.30	Keynote Talk Caernarfon Room	<p>Professor Ray Cole <i>University of British Columbia, Canada</i></p> <p>'Shifting Performance Expectations: Net Positive and Regenerative'</p>
10.30	Coffee & Networking	
11:00	Parallel Presentation Sessions	<p>Caernarfon: G01: Sustainable Buildings (1) Brecon: G02: Smart Energy Systems and Optimisation (1) Pembroke: S08: Advanced Building Envelope Technologies for High Performance (1) Kidwelly: S09: Analysis, Modelling and Control of Multisource Power Systems Caerphilly: S01: Towards Nearly Zero Energy Buildings: Issues and Potentials Posters: On view at back of Caernarfon Room, authors in attendance at coffee breaks</p>
13:00	Lunch	
14:00	Keynote Talk	<p>Professor Raimund Bleischwitz <i>University College London, UK</i></p> <p>'The Role of Resource Efficiency for Sustainable Construction</p>
15.00	Coffee & Networking	
15.30 17.30	Parallel Presentation Sessions	<p>Caernarfon: G01: Sustainable Buildings (2) Brecon: G02: Smart Energy Systems and Optimisation (2) Pembroke: S08: Advanced Building Envelope Technologies for High Performance (2) Kidwelly: G03: Renewable Energy Technologies and Integration with the Built and Natural Environment; S11: Solar Energy for the Middle East and North Africa; S12: Building Integrated Photovoltaics for the Mediterranean and Semi-Arid Regions Caerphilly: S13: Sustainable and Healthy Climates Posters: On view at back of Caernarfon Room; authors in attendance at coffee breaks</p>
19.00	Conference Dinner	The Custom House, Cardiff Bay

Conference Schedule

Friday

27 June 2014

8:15	Registration	
9:00	Keynote Talk Caernarfon Room	Professor Marco Perino <i>Politecnico di Torino, Italy</i> 'The Building Envelope: a Future Beyond the Concept of Thermal Insulation'
10.00	Coffee & Networking	
10.30	Parallel Presentation Sessions	Caernarfon: G01: Sustainable Buildings (3) Brecon: G02: Smart Energy Systems and Optimisation (3) & G01: Sustainable Buildings (4) Pembroke G02: Smart Energy Systems and Optimisation (4) Kidwelly: Poster Viewing; Authors in attendance
12.30	Lunch	
13.30	Keynote Talk Caernarfon Room	Dr Jarmila Davies <i>Welsh Government, UK</i> 'Is Knowledge Sharing a Sustainable Concept in the Increasingly Constrained Economic Context?'
14.30	Coffee & Networking	
15.00	Parallel Presentation Sessions	Caernarfon: G01: Sustainable Buildings (5) Brecon: G01: Sustainable Buildings (6) Kidwelly: Poster Viewing; Authors in attendance
17.00	Conference close Caernarfon Room	Presentation of Best Paper Awards Announcement about arrangements for SEB-15 Close

Paper Presentations

Thursday 26 June

11.00-13.00 - morning parallel sessions

Caernafon

G01: Sustainable Buildings (1)

Chair: Dr John Littlewood or Trevor Butler

Experimental Study on Thermal Comfort Conditions in Existing Public Primary Schools Buildings in Upper Egypt

Ahmed Saleem, Ali Abel-Rahman, Ahmed Hamza Ali, Shinichi Ookawara

Electricity Demand Profile of Australia Low Energy Houses

Seungho Lee, Wasim Saman, Dr. David Whaley

Impact of the Envelope Geometry on Cooling Demand in Very Airtight UK Dwellings under Current and Future Weather Projections

Yahya Lavafpour, Steve Sharples

A Social Learning Tool - barriers and opportunities for collective occupant learning in low carbon housing.

Magdalena Baborska-Narozny, Paul Chatterton, Fionn Stevenson

Energy and environmental performance of the 'Abertridwr community' first winter season

John Littlewood, Gareth Davies, Ivan Smallwood

A Brief Review of Literature and Methodology in OEB Research

Jing Zhao, Kate Carter

Posters: On view at the back of the Caernarfon Room; authors in attendance at coffee breaks

Thursday 26 June

11.00-13.00 - morning parallel sessions

Brecon

G02: Smart Energy Systems and Optimisation (1)

Chair: Dr Catalina Spataru

Physical energy storage employed worldwide
Catalina Spataru, Yen Chung Kok

An analysis of the impact of bioenergy and geosequestration in the UK future energy system in 2050
Catalina Spataru

Technical and Economic Perspective for Repowering of Micro Hydro Power Plants: a Case Study of an Early XX Century Power Plant
Antonio Gagliano, Francesco Nocera, Francesco Patania, Giuseppe Tina

Past Trends for the UK Energy Scenarios: How close are their predictions to reality?
Catalina Spataru, Eleni Zafeiratou

Two-stage optimization for building energy management
Jorn Gruber, Milan Prodanovic

Demand-side characterisation of the Smart City for energy modelling
Will Turner, Biswajit Basu, Oliver Kinnane

Thursday 26 June**11.00-13.00 - morning parallel sessions****Pembroke*****S08: Advanced building envelope technologies for high energy performance (1)*****Chair: Dr Alfonso Capozzoli**

The effectiveness of PCM wallboards for the energy refurbishment of lightweight buildings

Gianpiero Evola, Luigi Marletta

Simulating thermochromic and heat mirror glazing systems in hot and cold climates

Georgios Kokogiannakis, Cristina Aloisio, Jo Darkwa

Moisture buffering active devices for indoor humidity control: preliminary experimental evaluations

Elisa Di Giuseppe, Marco D'Orazio

Towards an ideal adaptive glazed facade for office buildings

Fabio Favoino, Qian Jin, Mauro Overend

An overview on solar shading systems for buildings

Francesco Minichiello, Laura Bellia, Concetta Marino, Alessia Pedace

A review of the performance of buildings with integrated Phase change material:

Opportunities for application in cold climate

Habtamu Bayera Madessa

Thursday 26 June

11.00-13.00 - morning parallel sessions

Kidwelly

S09: Analysis, Modelling and Control of Multisource Power Systems

Chair: Prof Aziz Naamane

Analysis and Simulation of the Energy Behavior of a Building equipped with RES in Simscape

Mouna Abarkan

Triphase cascaded inverter symmetric (5L) for PV systems controlled by various multicarrier PWM strategies

Abdelaziz Fri, Rachid El Bachtiri, Abdelaziz El Ghizal, Aziz Naamane

Contribution to the modeling of ageing effects in PV cells and modules

Bechara Nehme, Tilda Akiki, Nacer K M'Sirdi, Aziz Naamane

Analysing the impact of Eco-Design requirements on heating systems? A European case study

Rainer Elsland, Harald Bradke, Martin Wietschel

Overview of current development in compressed air energy storage technology

Jihong Wang, Krupke Christopher, Mark Dooner, Clarke Jonathan, Xing Luo

Great Britain's energy vectors and transmission level grid energy storage

I.A. Grant Wilson, Peter Hall, Anthony Rennie

Thursday 26 June**11.00-13.00 - morning parallel sessions****Caerphilly*****S01: Towards Nearly Zero Energy Buildings: issues and potentials*****Chair: Dr Elisa Di Giuseppe**

Are internal heat gains underestimated in thermal performance evaluation of buildings?

Rainer Elsland, Ilhan Peksen, Martin Wietschel

A case study investigation of indoor air quality in UK Passivhaus dwellings

Grainne McGill, Menghao Menghao, Lukumon Oyedele

Modelling Zero Energy Buildings: parametric study for the technical optimization

Enrico Fabrizio, Maria Ferrara, Marco Filippi, Frederic Kuznik, Joseph Virgone

A zero energy concept building for the Mediterranean climate

Francesco Causone, Salvatore Carlucci, Lorenzo Pagliano, Marco Pietrobon

Comparative study of two configurations of solar tower power for electricity generation in Algeria

Mohamed Abbas

Server Power Modeling for Run-time Energy Optimization of Cloud Computing Facilities

Patricia Arroba, Jose Ayala, Jose Moya, Katalin Olcoz, Jose Risco-Martín, Marina Zapater

Thursday 26 June

15.30-17.30 - afternoon parallel sessions

Caernafon

G01: Sustainable Buildings (2)

Chair: Dr John Littlewood or Trevor Butler

Experimental Study on Thermal Comfort Conditions in Existing Public Primary Schools Buildings in Upper Egypt

Ahmed Saleem, Ali Abel-Rahman, Ahmed Hamza Ali, Shinichi Ookawara

Effects of Air-Conditioning System on the Building Occupants' Work Performance.

Case Study: Office Building, Kedah, Malaysia

Norhidayah Md Ulang, Faizal Baharum, Shahril Nizam Ismail

Energy-efficient solutions for the restoration of a traditional building in the historical center of Catania (Italy)

Antonio Gagliano, Francesco Nocera, Francesco Patania, Vincenzo Sapienza

Reaching to net zero energy: The recipe to create zero energy homes in warm temperate climates

Stephen Berry, Kathryn Davidson, Wasim Saman, David Whaley

Informing Energy-efficient Building Envelope Design Decisions for Hong Kong

Xiaoxia Sang, M.M. Kumaraswamy, Wei Pan

Posters: On view at the back of the Caernarfon Room; authors in attendance at coffee breaks

Thursday 26 June
15.30-17.30 - afternoon parallel sessions

Brecon

G02: Smart Energy Systems and Optimisation (2)

Chair: Dr Catalina Spataru

Model-based fault detection and diagnosis of air handling units: A comparison of methodologies

Raymond Sterling, Gregory Provanb, Jesús Febresa, Dominic O'Sullivanc, Peter Strussd, Marcus M. Keane

Simplified method to derive the Kalman Filter covariance matrices to predict wind speeds from a NWP model

Conor Lynch, Michael O'Mahony, Ted Scully

System Approach For Building Energy Conservation & Management

Hossam A.Gabbar, Farayi Musharavati, Shaligram Pokharel

Control of Wind Conversion System for Autonomous System

Dahmane Menad, El-Hajjaji Ahmed, Bosche Jerome

Neuro-Fuzzy fault detection method for photovoltaic systems

Giuseppe Tina, Luca Bonsignore, Mehrdad Davarifar, Ahmed Elhajjaji, Abdelhamid Rabhi

Thermal metrics for data centers: a critical review

Alfonso Capozzoli, Lucia Liuzzo, Chinnici Marta, Gianluca Serale

Thursday 26 June

15.30-17.30 - afternoon parallel sessions

Pembroke

S08: Advanced building envelope technologies for high energy performance (2)

Chair: Dr Alfonso Capozzoli

Potentialities of a low temperature solar heating system based on slurry phase change materials (PCS)

Gianluca Serale, Alfonso Capozzoli, Ylenia Cascone, Enrico Fabrizio, Perino Marco

Light versus energy performance of office rooms with curtain walls: a parametric study

Valerio Lo Verso

Luigi Giovannini, Simone Iennarella, Valentina Serra

Thursday 26 June**15.30-17.30 - afternoon parallel sessions****Kidwelly*****G03: Renewable Energy Technologies and Integration with the Built and Natural Environment*****Chair: Prof Mahieddine Emziane**

Heave Buoy Energy Converters; Simulation of heave buoy response to wave in Malaysian water

Mohamad Abu Ubaidah Abu Zarim, Hardy Azmir Anuar, Rina Mohd Sharip, Mohd Afizi Mohd Shukran, Wan Baderul Hisan Wan Muda, Omar Zakaria

S11: Solar Energy for the Middle East and North Africa: From Materials and Devices to Systems and Applications**Chair: Prof Mahieddine Emziane**

Modelling and experimental analysis of a PEM electrolyser powered by a solar photovoltaic panel

Fatima Zohra Aouali, Mohamed Becherif, Mahieddine Emziane, Serge Krehi, Kamal Mohammedi, Abdulkader Tabanjat

S12: Building-Integrated Photovoltaics for the Mediterranean and Semi-Arid Climates**Chair: Prof Mahieddine Emziane**

Building Integrated Solar Desalination (BIDSAL) : preliminary works with multiple effect solar still

Hunhyun Pak

Foster in MED - Fostering Solar Technology in the Mediterranean area. An international project for the building integration of photovoltaic

Maddalena Achenza, Giuseppe Desogus

Strategies for combined use of power conditioning units in vehicles and buildings

Christian Schmicke, Lars Gusig, Jan Minnrich, Henrik Ruscher

Plate Temperature and Heat Transfer Characteristics of Artificially Roughened and Boosted Solar Air Heater

B.N. Prasad, G.N. Sah

Thursday 26 June
15.30-17.30 - afternoon parallel sessions

Caerphilly

S13: Sustainable & Healthy Buildings

Chair: Prof Jeong Tai Kim

Hand Gesture Recognition and Interface via a Depth Imaging Sensor for Smart Home Appliances

Tae-Seong Kim, Dong-Luong Dinh, Jeong Tai Kim

Logistic regression based multi-objective optimization of IAQ ventilation system considering healthy risk and ventilation energy

ChangKyo Yoo, MinJeong Kim, Jeong Tai Kim, SeungChul Lee, Pyo SeHee

A Study on the Healthy Housing Quality of Multi-family Attached House According to Dwelling Unit Age

Tae Kyung Lee, Na Na Kang

Creating sustainable building through exploiting human comfort

Geun Young Yun, Jeong Tai Kim

The impact of distance on the accuracy of luminance measurement

Gon Kim Kyung, Irakoze Amina, Jeong Tai Kim, Hong Soo Lim

Stock aggregation model and virtual archetype for large scale retro fit modeling of local authority housing in Ireland

James Pittam, Paul O'Sullivan, Garrett O'Sullivan

Friday 27 June**10.30-12.30 - morning parallel sessions****Caernafon*****G01: Sustainable Buildings (3)*****Chair: Dr John Littlewood or Professor Andrew Geens**

Toward Sustainable Building Design: Improving Thermal Performance by Applying Natural Ventilation in Hot-Humid Climate

Nedhal Al-Tamimi

An investigation into minimizing urban heat island (UHI) effects

Christopher O'Malley, Eric R. P. Farr, Jonathan Gates, Poorang A. E. Piroozfar

Thermal memory and transition in lobby spaces

Gloria Vargas, Fionn Stevenson

Energy Management and Air-Conditioning in Buildings in Mauritius: Towards Achieving Sustainability in a Small-Island Developing Economy Vulnerable to Climate Change

Mohammad Elahee

Thermal Exergy analysis of a building

Marta Giulia Baldi, Lorenzo Leoncini

On the hygrothermal performance of straw bale wall elements in Belgium

Jelle Langmans, Staf Roels, Alexis Versele

Friday 27 June

10.30-12.30 - morning parallel sessions

Brecon

G02: Smart Energy Systems and Optimisation (3)

Chair: Dr John Littlewood or Jon Moorhouse

A Python-Modelica Interface for Co-Simulation
Jesus Febres, Marcus Keane, Raymond Sterling

G01: Sustainable Buildings (4)

Chair: Dr John Littlewood or Jon Moorhouse

Evaluation of Chimney Stack Effect in a New Brewery Using DesignBuilder-EnergyPlus
Software
Charles Yousif, Sergio de La Torre de Juan

Building fan coil electric consumption analysis with fuzzy approaches for fault
detection and diagnosis
Fiorella Lauro, Alfonso Capozzoli, Imran Khan, Fabio Moretti, Stefano Panzieri, Stefano
Pizzuti

A Simplified Procedure for Sizing Solar Thermal Systems; Based on National
Assessment Methods in the UK and Ireland
Richard O'Hegarty, Oliver Kinnane, Sarah McCormack

Assessment standard for green store building of China
Wang Junliang, Li Guozhu, Wang QingQin

The retrofit of existing buildings through the exploitation of the green roofs
Antonio Gagliano, Stefano Aneli, Maurizio Detommaso, Francesco Nocera, Francesco
Patania

Friday 27 June**10.30-12.30 - morning parallel sessions****Pembroke*****G02: Smart Energy Systems and Optimisation (4)*****Chair: Dr Catalina Spataru**

Optimisation of a cogenerated energy systems: the cane biomass flexi-factory case study

Abdel Khoodaruth

Sensitivity analysis and validation of an EnergyPlus model of a house in Upper Austria

Welma Pereira de Jesus, Andreas Boegl

Wind Turbine Maximum Power Point Tracking Using FLC Tuned with GA

Mohamed Amine Haraouabia, Najib Essounbouli, Abdelaziz Hamzaoui

Malfunction and bad behavior diagnosis on domestic environment

Andrea Giantomassi, Gabriele Comodi, Francesco Ferracuti, Alessandro Fonti, Gloria Puglia

Energy efficiency comparison of a centralized and a multi-agent market based heating system in a field test

Olaf van Pruissen, Armin Togt, Ewoud Werkman

Lighting control based on worker's location information and illuminance preferences in a Smart Workplace

Kei Furukawa, Kazuhiro Sadakiyo, Tetsuya Yamada

Friday 27 June

10.30-12.30 - morning parallel sessions

Kidwelly

Poster Track

Chair: John Cosgrove or Stephanie Gauthier

Development of a methodology for architects for the assessment and integration of sustainable material use from the early design phase

Elke Meex, Griet Verbeeck

Kuwaiti Occupants Feedback on Government Dwelling at Al-Nahda Town

Mohammad Alhazim, John Littlewood, Keireine Canavan, Penny Carey

Actual performance of Indoor Environment Quality (IEQ) in sustainable buildings: A field study in China

Zufeng Pei, Borong Lin, Yan Chen Liu, Yingxin Zhu

Comparative Study of Green Buildings' Actual Operation Efficiency of Energy and IEQ in China

Yan Chen Liu, Borong Lin, Zyfeng Pei, YingXin Zhu

Development Of A Framework For Mapping Energy Usage And Carbon Dioxide Emissions In An Advanced Manufacturing Facility

John Cosgrove, John Littlewood, Paul Wilgeroth

Earth Tube Systems: Cooling Buildings in a Canadian climate

Trevor Butler, John Littlewood, Dr Huw Millward

Renewable Homes Feasibility Options for UK traditional buildings through Green Deal

Charikleia Moschou, Catalina Spataru

Posters on view all day with authors in attendance.

Friday 27 June**15.00-17.00 - afternoon parallel sessions****Caernafon*****G01: Sustainable Buildings (5)*****Chair: Dr John Littlewood or Professor Andrew Geens**

The adaptation of the 'porous residential building model' to hot dry climates: The case study of a residential block in Athens, Greece

Afroditi Maria Konidari, Mike Fedeski

Life cycle assessment of an apartment building: comparison of an attributional and consequential approach

Matthias Buyle, Amaryllis Audenaert, Johan Braet

Application of the LEED PRM to an Italian existing building

Enrico Fabrizio, Cristina Becchio, Stefano Corgnati, Valentina Monetti, Federico Seguro

Stand-alone calculation tools are not the answer to embodied carbon assessment

Chamindika Ariyaratne, Alice Moncaster

Evaluating the Efficacy of BREEAM Code for Sustainable Homes: A Cross-Sectional Study

Christopher O'Malley, Eric R. P. Farr, Jonathan Gates, Poorang A. E. Piroozfar

The daily and hourly energy consumption and load forecasting using artificial neural network method: a case study using a set of 93 households in Portugal

Filipe Rodrigues, Joao Calado, Carlos Cardeira

Friday 27 June

15.00-17.00 - afternoon parallel sessions

Brecon

G01: Sustainable Buildings (6)

Chair: Dr John Littlewood or Jon Moorhouse

Impact of aggregate type on air lime mortar properties

Sarah Scannell, Mike Lawrence, Pete Walker

Overview of testing methodologies for thermally improved hollow-core concrete blocks

Charles Yousif, Spiridione Buhagiar, Perit Caroline Caruana, Renzo Curmi, Charlon Grima

Glass Selection for High-Rise Residential Buildings in the United Arab Emirates based on Life Cycle Cost Analysis

Ahmed mokhtar, Ghaith Tibi

Impact of current steel lintels on the thermal performance of cavity wall buildings under the elemental recipe of Part L1A 2013

Francisco Sierra, Jiping Bai, Dr. Talal Maksoud

Friday 27 June**15.00-17.00 - afternoon parallel sessions****Kidwelly*****Poster Track*****Chair: John Cosgrove or Stephanie Gauthier**

Development of a methodology for architects for the assessment and integration of sustainable material use from the early design phase

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