

14th International Conference on Sustainable Energy Technologies

25th - 27th of August 2015, Nottingham, UK



Simplified Conference Programme

Day 1 Tuesday 25th August

09:00	Registration <i>Great Hall Foyer at the Albert Hall</i>			
09:30	Official Opening: Professor Sir David Greenway <i>Great Hall</i>			
09:40	Chairman Welcome: Professor Saffa Riffat <i>Great Hall</i>			
10:00	Keynote Speaker 1: Professor Matheos Santamouris <i>Great Hall</i>			
11:00	Coffee Break & Poster Session A <i>Osborne Suite</i>			
11:30	Session 1 <i>Great Hall</i>	Session 2 <i>Balmoral Gallery</i>	Session 3 <i>City Suite</i>	Session 4 <i>Osborne Lounge</i>
12:30	Lunch Break <i>Osborne Suite</i>			
13:30	Session 5 <i>Great Hall</i>	Session 6 <i>Balmoral Gallery</i>	Session 7 <i>City Suite</i>	Session 8 <i>Osborne Lounge</i>
14:50	Coffee Break & Poster Session B <i>Osborne Suite</i>			
15:20	Session 9 <i>Great Hall</i>	Session 10 <i>Balmoral Gallery</i>	Session 11 <i>City Suite</i>	Session 12 <i>Osborne Lounge</i>
16:40	Keynote Speaker 2: Professor Tianshou Zhao <i>Great Hall</i>			
17:40	Comfort Break			
18:00	City walk to the Nottingham Castle: Robin Hood <i>Great Hall Foyer</i>			
18:30	Group photo at the Nottingham Castle grounds			
18:45	Civic Reception with the Lord Mayor of Nottingham <i>Nottingham Castle Long Gallery</i>			
19:00	Message from the Chair: Professor Saffa Riffat			
19:10	Welcome to Nottingham by the Lord Mayor Councillor Jackie Morris			
	Drinks & Nibbles			
20:30	Free evening			

Day 2 Wednesday 26th August

09:00	Keynote Speaker 3: Professor Edward NG <i>Great Hall</i>			
10:00	Session 13 <i>Great Hall</i>	Session 14 <i>Balmoral Gallery</i>	Session 15 <i>City Suite</i>	Session 16 <i>Osborne Lounge</i>
11:00	Coffee Break & Poster Session C <i>Osborne Suite</i>			
11:30	Session 17 <i>Great Hall</i>	Session 18 <i>Balmoral Gallery</i>	Session 19 <i>City Suite</i>	Session 20 <i>Osborne Lounge</i>
12:30	Lunch Break <i>Osborne Suite</i>			
13:30	Session 21 <i>Great Hall</i>	Session 22 <i>Balmoral Gallery</i>	Session 23 <i>City Suite</i>	Session 24 <i>Osborne Lounge</i>
14:50	Coffee Break & Poster Session D <i>Osborne Suite</i>			
15:20	Session 25 <i>Great Hall</i>	Session 26 <i>Balmoral Gallery</i>	Session 27 <i>City Suite</i>	Session 28 <i>Osborne Lounge</i>
16:40	Keynote Speaker 4: Chris Twinn <i>Great Hall</i>			
17:40	Close			
	Comfort Break			
19:30	Gala dinner & Awards Ceremony <i>Crowne Plaza Nottingham - Ball Room</i> <i>(Wollaton Street, NG1 5RH)</i>			
23:30	Close			

Day 3 Thursday 27th August

09:00	Keynote Speaker 5: Professor Chi-Hwa Wang <i>Great Hall</i>			
10:00	Session 29 <i>Great Hall</i>	Session 30 <i>Balmoral Gallery</i>	Session 31 <i>City Suite</i>	Session 32 <i>Osborne Lounge</i>
11:00	Coffee Break & Poster Session E <i>Osborne Suite</i>			
11:30	Session 33 <i>Great Hall</i>	Session 34 <i>Balmoral Gallery</i>	Session 35 <i>City Suite</i>	Session 36 <i>Osborne Lounge</i>
12:30	Buffet Lunch <i>Osborne Suite</i>			
13:30	Close			
14:00	Tours <i>Consult registration desk to sign up for tours</i>			
18:00	Close			

Key

	Energy Technology & Renewables
	Energy Storage & Conversion
	Sustainable Cities & Environment
	Policies & Management

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Conference Programme - Day 1 Tuesday 25th August

09:00	Registration <i>Great Hall Foyer at the Albert Hall (North Circus Street, NG1 5AA)</i> <i>(registration will be open from 15:00hrs Monday 24th August)</i>			
09:30	Official Opening of SET 2015: Professor Sir David Greenway, Vice-Chancellor of the University of Nottingham <i>Great Hall</i>			
09:40	Chairman Welcome: Professor Saffa Riffat <i>Great Hall</i>			
10:00	Keynote Speaker 1: Professor Matheos Santamouris Urban Warming: Evidence, Impacts and Mitigation Chair: Professor Saffa Riffat <i>Great Hall</i>			
11:00	Coffee Break & Poster Session A <i>Osborne Suite</i>			
	Session 1: Biofuels & Biomass <i>Great Hall</i> Chair: Yanjun Dai	Session 2: Heating and Cooling Systems <i>Balmoral Gallery</i> Chair: Xudong Zhao	Session 3: Sustainable and Resilient Cities <i>City Suite</i> Chair: Edward Ng	Session 4: Environmental Issues and the Public <i>Osborne Lounge</i> Chair: Chris Twinn
11:30	335: Technological and commercial maturity of aviation biofuels <i>Rebecca Mawhood, Evangelos Gazis and Raphael Slade</i>	51: Identification of chiller maintenance factors using the Bayesian Markov chain Monte Carlo Method <i>Pei Huang and Gongsheng Huang</i>	156: A simplified 3D urban unit representation for urban microclimate simulations: A case study in China's 'Hot Summer and Cold Winter' climate zone <i>Leonidas Bourikas, Patrick A.B. James, Mark F. Jentsch, Tianfeng Shen, David H.C. Chow, Jo Darkwa and Abubakr S. Bahaj</i>	304: Income Growth and Sustainable Behavior Motivation In Developing Countries – Understanding the Relationship According to the Environmental Kuznets Curve (EKC) <i>Amira Elbortokaly, Nihal Abdelgawwad and Ahmed Shalaby</i>
11:50	430: Production and Testing of Biodiesel Methyl Ester fuels from Tropical Seed oil Feedstocks <i>Ogbene Gillian Igbum, Andrew Chukwudum Eloka-Eboka and Jacob Samuel Aliyu</i>	209: Experimental optimization of CI Engine Operated Micro-Trigeneration System for Power, Heating and Space Cooling <i>Rahul Goyal, Dilip Sharma, S.L. Soni, Pradeep Kumar Gupta and Dheeraj Johar</i>	347: Public spaces for resilient cities <i>Luca Maricchiolo</i>	202: Empirical study of the energy saving potentials in Shanghai residential buildings through human behaviour change <i>Xingxing Zhang, Jingchun Shen, Jinlu Si, Tong Yang, Wu Deng, Llewellyn Tang and Yupeng Wu</i>
12:10	31: Novel Two-stage High-solid Anaerobic Digestion of Food Waste and Grass <i>Wangliang Li, Yen Wah Tong, Kai Chee Loh, Jingxin Zhang, Junwei Lim and Yanjun Dai</i>	303: Performance Assessment of Residential Scale Solar Driven Adsorption Cooling System in Hot Arid Areas and Gained Operational Experiences <i>Ahmed Hamza H Ali</i>	389: Developing Indicators Framework to Evaluate the Sustainability of Urban Infrastructure Systems in Middle Eastern Cities <i>Mustafa Al-Alwani and Suad Alfatlawi</i>	495: The Role of Community-based Energy Management Schemes in Supporting Resilience <i>Travis O'Doherty, Lucelia Rodrigues and Mark Gillott</i>
12:30	Lunch Break <i>Osborne Suite</i>			
	Session 5: Building Energy Systems <i>Great Hall</i> Chair: Osmann Sari	Session 6: Heating and Cooling Systems <i>Balmoral Gallery</i> Chair: Enzo Zanchini	Session 7: Energy Demand and Use Optimization <i>City Suite</i> Chair: Spencer Dutton	Session 8: Energy and Environment Security <i>Osborne Lounge</i> Chair: Mahroo Eftekhari
13:30	82: Thermodynamic Optimization for Central Heating System by Using Industrial Waste Heat through Absorption Heat Transformer <i>Yin Zhang, Fei Xiong, Wenxing Shi, Yiping Zhang and Xin Wang</i>	359: New composite materials based on anodic alumina for adsorption heat transformers <i>Alexandra Grekova, Vasily Nikulin, Ilya Girmik, Mikhail Tokarev, Larisa G. Gordeeva and Yuri I. Aristov</i>	193: Towards an integrated computational method to optimise design strategies for the built environment <i>Polytimi Sofotasiou, Ben Hughes and John Calautit</i>	456: The Need for UN Climate Change Policy Reformation <i>Sharaf Eldin I. Bannaga and Siddig Omer</i>
13:50	339: Heating and ventilation flow pulsation for energy saving and indoor air quality <i>M. Embaye, R. K. Al Dadah and S. Mahmoud</i>	362: Cooling applications with renewable energy powered resorption systems <i>Bilsay Pastakkaya, Erdem Cuce and Pinar Mert Cuce</i>	369: Predictive Control Algorithm for Multilevel Inverter in High Performance Load <i>Ali Almaktoof, Atanda Raji and Mohamed Toriq Kahn Model</i>	360: Renewable Energy Options and the Nigerian built Environment <i>Ferdinand Daminabo and Samuel Dike</i>
14:10	23: Experimental investigation of CO2 gas cooler/condenser in a refrigeration system <i>Konstantinos Tsamos, Yunting Ge and I Dewa Santosa</i>	449: A Comparative Analysis of the Maisotsenko cycle based Air-conditioning Systems: Ejector cooling vs. Desiccant <i>Olexiy Buyadgie, Dmytro Buyadgie, Oleksii Drakhnia, Valeriy Maisotsenko, Takahiko Miyazaki and Andrei Chamchine</i>	453: Are batteries the PV energy self-consumption optimisation solution for homes? <i>David Parra, Gavin S. Walker and Mark Gillott</i>	240: Risk assessment in a central receiver system <i>Danyela Samaniego, Almerindo D. Ferreira and Manuel C. Gameiro Da Silva</i>
14:30	462: Energy efficiency improvements in paper mills by combined heat and power systems <i>Imran Shabbir and Mojtaba Mirzaeian</i>	280: A Carbon Neutral Small Scale District Heating <i>Michele Tunzi, Edward Cooper and Rabah Boukhanouf</i>	169: Sensitivity analysis for minimization of input data for urban scale heat demand forecasting <i>Aneta Strzalka, Dirk Monien, Athanasios Koukofikis and Ursula Eicker</i>	39: Techno-economic assessment of an integrated solar combined cycle power plant in semi-arid region in Algeria <i>Boualem Zeroual, Abdelhafidh Moummi and Arezki Smaïli</i>
14:50	Coffee Break & Poster Session B <i>Osborne Suite</i>			

	Session 9: Low-carbon/ Low-energy Technologies <i>Great Hall</i> Chair: Michele Bottarelli	Session 10: Ventilation and Air Conditioning <i>Balmoral Gallery</i> Chair: Li Shao	Session 11: Energy Efficiency in Buildings <i>City Suite</i> Chair: Patrick James	Session 12: Energy and Environment Policies <i>Osborne Lounge</i> Chair: Sharaf Bannaga
15:20	203: Engine Performance and Emission Characterization of modelled Biodiesel fuels from Moringa oleifera and Jatropha curcas seeds oils and Hybrids <i>Andrew C. Eloka-Eboka</i>	93: Experimental study and modelling of air distribution systems and temperature control for chilled food factories in a scaled test facility <i>Demetris Parpas, Carlos Amaris and Savvas Tassou</i>	251: Using Post Occupancy Evaluation data to understand student use of indoor environmental controls in a modern halls of residence <i>Rucha Amin, Despoina Teli, Patrick James and Leonidas Bourikas</i>	26: JIC Green Initiative Project (GIP) <i>Mohammed Aleid, Shareef Alshekshaky, Fouad Zayadin, Mohammed Hanifa, Mohammed A. Baseer, Mohsin Alshakhouri, Vadrevu Kamaraju and Mohammed A. Ajra</i>
15:40	113: Performance and emissions prediction of natural gas engine using two-zone combustion model <i>Yu Ding, La Xiang, Jialin Cui and Kui Wang</i>	137: Numerical study of a novel corrugated heat exchanger for dew point air cooler <i>Peng Xu, Xudong Zhao, Xiaoli Ma, Deying Li, Yongzheng Shi and Yaxuan Xiong</i>	115: A Post-Occupancy Case Study on the Relationship between Domestic Energy Use and Occupancy Profiles <i>Sophie Naylor, Mark Gillott and Edward Cooper</i>	445: Energy Uses and Climate Change Mitigation: Assessing the Roles of Robust energy Efficiency Practices <i>Samuel Dike and Ferdinand Daminabo</i>
16:00	34: Exergy analysis on the steam gasification at the dual fluidized bed gasifier <i>Xiaoming Li, Peng Li, Jin Bai and Junxi Jia</i>	262: Operation performance of separated heat pipe in data center <i>Tao Ding, Zhiguang He, Zhen Li and Zhenying Wang</i>	475: Investigating the energy performance and indoor environmental quality of a social housing building <i>Afroditi Synnefa, Rosa Francesca de Masi, Konstantina Vassilakopoulou, Elena Mastrapostoli, Theoni Karlessi and Mat Santamouns</i>	342: Sustainable educational buildings: A proposal for changes to investment evaluation policies in Chile through the incorporation of thermal comfort and air quality criteria <i>Jaime Soto Muñoz, Maureen Trebilcock and Alexis Perez Fargallo</i>
16:20	494: Thermodynamic efficiency of IGCC plant with overheated cycle air and two-stage gasification <i>Denis Svishchev, Alexandre Keiko, Igor Donskoy, Alexander Kozlov, Shamansky Vitaly and Ryzhkov Alexander</i>	431: A study on performance improvement of enthalpy exchanger with the modified function layers <i>Chuanyu Zhang, Jingcui Xu, Tianshu Ge and Yanjun Dai</i>	183: Appraisal of a Zero Energy Solar House model via reduction of the GHG emission and improvement of energy efficiency <i>Claudia Oliveira, Fernanda Antonio and Miguel Udaeta</i>	427: Supply side initiatives for overcoming electricity crisis in Pakistan <i>Muhammad Aslam Uqaili, Nayyar Hussain, Khanji Harijan and Abdullah Mengal</i>
16:40	Keynote Speaker 2: Professor Tianshou Zhao Innovating Energy Storage Technologies for a Sustainable Energy Future Chair: Dr Lucelia Rodrigues <i>Great Hall</i>			
17:40	Comfort Break			
18:00	Historic city walk to the Nottingham Castle with Robin Hood (5-10 minutes walk) <i>Great Hall Foyer</i>			
18:30	Group photo at the Nottingham Castle grounds			
18:45	Civic Reception with the Lord Mayor of Nottingham at the historic Nottingham Castle with drinks and nibbles <i>Nottingham Castle Long Gallery</i>			
19:00	Message from the Chair: Professor Saffa Riffat			
19:10	Welcome to Nottingham by the Lord Mayor of Nottingham: Councillor Jackie Morris			
20:30	Free evening (consult the registration desk if you want to join us for an informal dinner)			

Poster Session A

Tuesday 25th August 11:00hrs, Osbourne Suite and Syndicate Rooms

293: SOC Management of BESS for Frequency Regulation <i>Jin-Sun Yang, Jin-Young Choi, Dong-Jun Won, In-Sun Choi, Geon-Ho An and Yeong-Jun Choi</i>	487: Development of energy monitoring center for demonstrative research of energy network of KIER <i>Ho-Sang Ra, Gilbong Lee, Sun Ik Na, Junhyun Cho and Young-Soo Lee</i>	284: Space cooling in buildings in Hot and Humid Climates – a review of the effect of Humidity on the Applicability of Existing Cooling Techniques <i>Adrian Rosseto Katili, Rabah Boukhanouf and Robin Wilson</i>	422: Energy modelling applications in Pakistan and formulation of national energy policies <i>Nayyar Hussain, Mohammad Aslam Uqaili, Khanji Harijan and Gordhan Valasai</i>
348: Assessing the Benefits of Installing Energy Storage in a Household Equipped with Photovoltaic Panels <i>Christian Klumpner and Alaa El Boudali</i>	392: Environmental effects of ground source heat pump system with vegetation on the ground surface <i>Xuanyu Chang, Yong Li and Ruzhu Wang</i>	271: Economic evaluation of a CAES system for increased wind penetration to Egyptian grid <i>Omar Ramadan, Siddiq Omer and Saffa Riffat</i>	155: Existing metrics, codes and technologies for HVAC design of energy-efficient data centre: A literature review <i>Zishang Zhu, Xudong Zhao, Yan Lu and Yanyi Sun</i>
426: Energy management systems for microgrids <i>Victor Maryama, Frederico Viveiros Jordan, Vitor Seger Zeni, Cesare Quinteiro Pica and Gabriel Aurélio de Oliveira</i>	66: The adaptability of night cooling technology under different climates <i>Shenyi Wu and Zhongzhe Wu</i>	351: A Comparative analysis of the dairy milk cooling systems in selected farms in the Eastern Cape Province of South Africa <i>Russel Mhundwa, Michael Simon, Stephen Tangwe and Edson Meyer</i>	206: Transportation energy consumption and emissions- a view from city of Indonesia <i>Iwan Sukarno and Hiroshi Matsumoto</i>
118: Electric vehicle role in PV self-consumption optimisation <i>Dainius Alonderis, Mark Gillott</i>	259: Theoretical analysis of a membrane-based liquid desiccant system <i>Ziwei Chen, Yuqi Pan and Jie Zhu</i>	144: CFD simulation of wind environment around a high-rise building at pedestrian level in Hong Kong <i>Deqi Wang, Lin Lu, Ping Cui and Yu Jiang</i>	

Poster Session B

Tuesday 25th August 14:50hrs, Osbourne Suite and Syndicate Rooms

31: Novel Two-stage High-solid Anaerobic Digestion of Food Waste and Grass <i>Wangliang Li, Yen Wah Tong, Kai Chee Loh, Jingxin Zhang, Junwei Lim and Yanjun Dai</i>	97: Quick U-value measurements and analysis <i>Lia De Simon, Marco A. Iglesias, Christopher J. Wood, David Tetlow and Edward W. Cooper</i>	483: Maintainability: A Best-Practice Approach to Building Design <i>Owajonyi Frank and Siddiq Omer</i>	361: Thermal performance assessment of porous fins via homotopy perturbation method <i>Erdem Cuce and Pinar Mert Cuce</i>
104: Application of Biochar Arising from Gasification in Amendment of Soil of Secondary Forest on Degraded Land <i>Zhanyu Yang, Shun Kai Koh, Reuben Chong Jin Lim, Ye Shen, Clive Chong, Yifan Haw, Hugh Tiang Wah Tan, Yen Wah Tong and Chi-Hwa Wang</i>	116: Software to determine the energy and light transmission of glass facades in conjunction with special daylight redirecting systems <i>Yang Li, Helmut Koester and Bernd Bruegge</i>	234: Theoretical investigation of soil-based thermal energy storage system for greenhouses <i>Erdem Cuce, Yate Ding, Saffa Riffat and Chungui Lu</i>	203: Engine Performance and Emission Characterization of modelled Biodiesel fuels from Moringa oleifera and Jatropha curcas seeds oils and Hybrids <i>Andrew C. Eloka-Eboka</i>
74: Experimental Evaluation of an Integrated Phase Change Material Blind System for Double Skin Façade Buildings <i>Yilin Li, Jo Darkwa and Georgios Kokogiannakis</i>	180: The state of the art: Superinsulation construction materials under the UK's domestic energy building: Aerogel and vacuum insulation technology applications <i>Mahmoud Shatat, Theo Elmer, David Tetlow and Saffa Riffat</i>	312: Kinetics of direct CO ₂ capture from ambient air using K ₂ CO ₃ /Al ₂ O ₃ composite sorbent <i>Zhanna Veselovskaya, Vladimir Derevichikov and Aleksey Okunev</i>	105: Co-gasification of Woody Biomass and Solid Waste for Clean Energy Production <i>Pengwei Dong, Weicheng Ng, Thawatchai Maneerung, Zhanyu Yang, Ye Shen, Xiang Kan, Koon Gee Neoh, Chi-Hwa Wang, Yen Wah Tong, Yanjun Dai and Clive Chong</i>
85: Experimental investigation of open sorption pipe heat storage under North Cyprus climate conditions <i>Devrim Aydin, Sean Casey and Saffa Riffat</i>	205: Performance of an intuitive, adaptive BEMS <i>Thomas Whiffen, Mark Gillott, Christopher Wood and Saffa Riffat</i>	341: Experimental investigation of impact of Diesel Particulate Filter on performance and emissions of a Bharat Stage-1 C.I. engine <i>Pradeep Kumar Gupta, Dilip Sharma, Shyam Lal Soni, Rahul Goyal, Dheeraj Kishor Johar, Ashok Singh Tanwar and Anmesh Kumar Srivastava</i>	395: Fixed-bed staged gasification of biomass: rate-controlled equilibrium modeling <i>Igor Donskoy, Alexander Keiko, Alexander Kozlov, Vitaly Shamansky and Denis Svishchev</i>
86: Energy-efficient daylight devices <i>Helmut Koester</i>	212: Photovoltaic Vacuum Glazing For Low Carbon Buildings <i>Abdulelah Alotaibi and Riffat Saffa</i>	356: Working Fluids and Technologies to Cool and Power the Future <i>Saffa Riffat, Devrim Aydin, Richard Powell and Yijun Yuan</i>	

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Conference Programme - Day 2 Wednesday 26th August

09:00	Keynote Speaker 3: Professor Edward NG Sustainable Living in Compact Urban and Built Environment in the Tropics Chair: Professor Brian Ford <i>Great Hall</i>			
	Session 13: Biomass Systems <i>Great Hall</i> Chair: T S Zhao	Session 14: Smart and Responsive Buildings <i>Balmoral Gallery</i> Chair: Clito Afonso	Session 15: Green and Sustainable Buildings <i>City Suite</i> Chair: Sanghoon Lim	Session 16: Solar Energy <i>Osborne Lounge</i> Chair: Liben Jiang
10:00	9: Effect of different seeding sludge on the energy recovery potential of food waste during anaerobic digestion: A microbial community profile study <i>Jun Wei Lim, Jason Zhi Nan Tan, Kai Chee Loh, Yanjun Dai and Yen Wah Tong</i>	170: Numerical analysis of the humidity buffering potential of various hygrothermal coatings under extreme moisture loading scenarios <i>Sean Casey</i>	63: A Brief Discussion on Current Vertical Greenery Systems in Hong Kong: The Way Forward <i>K.W.D.K.C. Dahanayake and Nadia C.L. Chow</i>	49: Performance Test of a Solar Concentrating System with Cylindrical Fresnel Lens <i>Zheng Hongfei and Ma Xinglong</i>
10:20	27: Exergy Analyses of an Integrated Solid Oxide Fuel Cell and Biomass Gasification System <i>Junxi Jia</i>	148: Fabrication and demands of Self-cleaning hydrophobic surface for buildings <i>Hongxia Chen, Yuyin Yan and Yangli Mao</i>	58: The Investigation of Practice on Green Residential Buildings in ShenZhen, China <i>Liqing Zhang and Liben Jiang</i>	54: An Experimental Study on the Thermal Performance of Multi-Surface Compound Trough Solar Air Concentrators with Dual Collector Tubes <i>Haoshu Ling, Chao Chen, Hong Qin, Na Li, Mingxing Zhang, Hongfei Zheng and Shen Wei</i>
10:40	30: Three-stage anaerobic co-digestion of high-solids food waste and horse manure <i>Jingxin Zhang, Yen Wah Tong, Kai Chee Loh, Wangliang Li and Jun Wei Lim</i>	204: PCM ceiling tile performance under differing ventilation rates <i>Thomas Whiffen</i>	123: Climate-responsive Design in Contemporary Australian Housing. The poetics and pragmatics in the Ball-Eastaway and Marika-Alderton house by Glenn Murcutt <i>Mauricio Lecaro and Benson Lau</i>	100: Heat Transfer Analysis of Ferrofluids Based Solar Parabolic Trough Collectors <i>Mustafa Alsaady, Yuying Yan and Rabah Boukhanouf</i>
11:00	Coffee Break & Poster Session C <i>Osborne Suite</i>			
	Session 17: Biomass & Biofuels <i>Great Hall</i> Chair: Chi-Hwa Wang	Session 18: Phase Change Materials <i>Balmoral Gallery</i> Chair: Shuli Liu	Session 19: Green Buildings and Materials <i>City Suite</i> Chair: Wail Al-Rifaie	Session 20: Solar Energy <i>Osborne Lounge</i> Chair: Hongfei Zheng
11:30	46: Energy Valuation of the Abattoir waste by Co-Digestion Process: for Production of Biogas <i>Maamar Fedailaine, Karima Moussi, Sabah Abada and Meryem Saber</i>	316: Experimental Study of Heat Transfer during mPCM Slurry Flow in Microchannels <i>Rabia Shaukat, Muhammad Sajid Kamran, Saqib Raza Jivani, Lei Chai, Jie Sun and Hua Sheng Wang</i>	76: Study on Case Analysis and Support System Development for Green Remodeling of Building <i>Ji-Yeon Park and Chang-U Chae</i>	64: Performance Investigation on Vertical Diffusion Multi-Effect Solar Still with Parallel Feed <i>H Sharon and K S Reddy</i>
11:50	315: Performance and Emission Profile of Micro-algal biodiesel in Compression Ignition Engine <i>Andrew C. Eloka-Eboka, Babatunde F. Bakare and Senzo.J. Malinga</i>	441: Shape-Stabilized Phase Change Materials (SSPCM) with balanced thermal property, strength, thermal conductivity and durability <i>Rui Yang, Yi Wang, Jianping Wang and Weixia Wang</i>	217: Technology Research and Development Boost the Development of Green Building in China <i>Qingqin Wang and Shangqun Xie</i>	78: Experimental investigation of a new rotatable-axis tracking solar parabolic trough collector <i>Hui Hong, Shuo Peng, Wei Han and Hongguang Jin</i>
12:10	153: Esterification of oleic acid with low carbon chain alcohols by a series of sulfonated carbon-based solid acid microspheres <i>Honglei Zhang, George Z. Chen, Feng He and Tao Wu</i>	467: A Novel Building Façade Integrated with TIM and PCM --- Numerical Study for Summer <i>Xin Wang</i>	25: Precast Ferrocement Hollow Core Slab/ Wall Panels <i>Wail Al-Rifaie and Ahmed Sakran</i>	91: Simulation and experimental research on the solar absorption cooling system driven by linear Fresnel reflector solar collectors with thermal storage <i>Lingyu Zhou, Yanjun Dai and Ruzhu Wang</i>
12:30	Lunch Break <i>Osborne Suite</i>			
	Session 21: Solar Energy <i>Great Hall</i> Chair: Ji Jie	Session 22: Solar Energy <i>Balmoral Gallery</i> Chair: Yijun Yuan	Session 23: Smart and Responsive Buildings <i>City Suite</i> Chair: David Parra Mendoza	Session 24: Energy Efficiency in Buildings <i>Osborne Lounge</i> Chair: Marco Noro
13:30	182: Investigation on the overall energy performance of an a-Si based photovoltaic double-skin facade in Hong Kong <i>Jinqing Peng, Lin Lu, Hongxing Yang, Aotian Song and Tao Ma</i>	249: Investigation on the applicability of screw expander in distributed solar thermal electricity generating systems <i>Pengcheng Li, Jing Li, Gang Pei, Jahan Zeb Alvi and Jie Ji</i>	263: Intelligent Building Management System for Energy Demand and Supply Optimisation <i>Hasan Ufuk Gökçe and Kamil Umur Gökçe</i>	261: Design and Optimisation of a Novel Passive Cooling Wind Tower <i>John Kaiser Calautit, Ben Richard Hughes and Polytimi Sofotasiou</i>
13:50	471: Dust Accumulation and PV Power Output in the Tropical Environment of Barbados <i>Darlene Field, Thomas Rogers and Andrea Sealy</i>	283: Thermal performance of an experimental solar pond provided with heat exchanger in Egypt <i>Wessam E. Abd Allah, M.A. Tawfik and M.K. Abd El-Wahab</i>	16: Applied Thermal Comfort Control <i>Peter Simmonds and Andre Jonker</i>	372: Assessing Energy Efficiency in a Newly Designed Office Building: Case Study Petrojet Company New Head Office Building in Cairo, Egypt <i>Nayera R. Abdallah, Ali K. Abel-Rahman, S. Ookawara and Essam K. Mahros</i>
14:10	401: A novel multifunctional PV/Thermal/Daylighting (PV/T/D) panel based on miniature dielectric CPC <i>Yuehong Su, Xu Yu and Zheng Hongfei</i>	311: Performance Evaluation of Photovoltaic panel Integrated with Compound Parabolic Concentrator (CPC) Installed in Hot Arid Area <i>Mohamed Yousef, Ali Abdel Rahman, Sameh Nada and Shinichi Ookawara</i>	322: Solar thermal collector model for high-resolution stochastic bottom-up domestic energy demand models <i>Paul Henshall, Eoghan McKenna, Murray Thomson and Philip Eames</i>	200: Thermal Performance Assessment of New Type Structure Applied in Tent <i>Jun Wang, Siqiang Lv, Feng Xiong and Ming Quan</i>
14:30	140: A novel way to calculate the light transmittance loss of glass for Photovoltaic (PV) modules according to known accumulated dust density <i>Yu Jiang and Lin Lu</i>	196: High Efficiency Absorber with Perforated Plate for Solar Air Collector <i>Vinson Adidharma Audwinto, Hoy-Yen Chan, Sina Enteshari and Vinesh Thiruchelvam</i>	52: Numerical Method to Select Chiller Sequence Control Concerning Uncertainties <i>Yundan Liao and Gongsheng Huang</i>	18: A Study on Development of Simplified PMV Regression Model in Office Building <i>Sung Jun Yun and Jung-Ho Huh</i>
14:50	Coffee Break & Poster Session D <i>Osborne Suite</i>			

	Session 25: Building Energy Technologies <i>Great Hall</i> Chair: Mat Santamouris	Session 26: Solar Energy <i>Balmoral Gallery</i> Chair: Hoy Yen	Session 27: Energy Efficiency in Buildings <i>City Suite</i> Chair: Andrew Cunningham	Session 28: Energy Efficiency in Buildings <i>Osborne Lounge</i> Chair: Naghman Khan
15:20	11: Ecoshopping: energy efficient & cost competitive retrofitting solutions for retail buildings – a review of best practice <i>Andy Lewry and Ed Suttie</i>	305: Experimental research and theoretical analysis of a novel testing platform for the thermal performance of solar domestic water heating systems Yihong Yang, Wei He, Jie Ji, Yanqiu Wang and Mao Jun	252: A novel approach on measuring solar transmittance of glazings <i>George Gorgolis, Dimitris Karamanis and Nikos Skandalos</i>	48: Simulation and Parametric Analysis of an Office Building Energy Performance under Danish Conditions <i>Muhyiddine Jradi, Ane Zorroza Gamboa and Christian Veje</i>
15:40	138: An Innovative External Wall Insulation System for Solid Wall Houses <i>Jennifer White, Lucelia Rodrigues, Mark Gillott and Renata Tubelo</i>	320: Numerical Investigation of Thermocline Packed Bed Thermal Energy Storage System for CSP Plants Ajas Abdulla and K. S. Reddy	331: The Investigation of the Luminous Environment in ETFE Structures <i>Dawa Azad Aziz Masih and Benson Lau</i>	15: A Comparison of Energy Usage between a Radiant Ceiling System, an Active Beam System and a Fan Coil System compared to a VAV System <i>Peter Simmonds and Jason Kirchhoff</i>
16:00	384: Energy and economic analysis of different solutions for the retrofitting of the heating and cooling plant for a residential care home for elderly people <i>Marco Noro and Giacomo Bagarella</i>	278: Nano-Composite "Vermiculite-CaCl ₂ " matrix for open thermochemical heat storage: Experimental investigation of cyclic behaviour and numerical determination of the "operating line" <i>Devrim Aydin, Sean Casey and Saffa Riffat</i>	327: Performance Assessment of SageGlass Electronically Tintable Glazing <i>Dan Jestico</i>	95: Analysis and Design Optimization of a Photovoltaic Airflow Window for Winter Heating Seasons <i>Abdullah Haredy</i>
16:20	40: Overall energy performance analysis of a living lab building in Denmark <i>Ana Ionesi, Muhyiddine Jradi and Christian Veje</i>	59: Performance Analysis of Heat Pipe-Based Photovoltaic-Thermoelectric Generator (HP-PV/TEG) Hybrid System <i>Adham Makki, Siddig Omer, Yuehong Su and Saffa Riffat</i>	135: High Capacity Energy Efficiency Solar Glass <i>Chin-Huai Young, Saffa Riffat and Erdem Cuce</i>	323: The Potential of External Shading Devices for Comfort Extension and Energy Savings in Kenya <i>Lorna Kiamba, Lucelia Rodrigues and Benson Lau</i>
16:40	Keynote Speaker 4: Chris Twinn The goalposts are changing – are we ready for the new direction? Chair: Professor Mark Gillott <i>Great Hall</i>			
17:40	Close			
19:30	Gala Dinner & Awards Ceremony <i>Crowne Plaza Nottingham - Ballroom (Wollaton Street, NG1 5RH)</i>			
23:30	Close			

Poster Session C

Wednesday 26th August 11:00hrs, Osbourne Suite and Syndicate Rooms

220: Numerical simulation of a new biomass/solar micro-cogeneration ORC system <i>Ana I. Palmero Marrero, João Soares and Armando Oliveira</i>	355: Effect of Dusty Environment on the Electrical Performance of Different Photovoltaic Modules <i>Adel Aldihani, Abdulrahman Aldossary, Raya Al-Dadah, Saad Mahmoud and Ayman Al-Qattan</i>	75: Experimental Research on Cooling Effect of Battery Pack with Liquid Flow Heat Exchange Structure <i>Tianshi Zhang, Qing Gao, Yanlong Gu, Guohua Wang, Kaipeng Zhang, Cong Xiao and Y.Y Yan</i>	274: The review of solid and liquid desiccant cooling technologies in sustainable energy development <i>Mohd Anas Mohd Sabri, Siddig Omer and Saffa Riffat</i>
238: Solar-panels-assisted heat pump - A sustainable system for domestic low-temperature space heating applications <i>Elamin Mohamed, Saffa Riffat and Siddig Omer</i>	357: Optical Analysis of Flux Uniformity and Efficiency in Low Concentrating PV Systems <i>Abdulmaged Algareu, Abdulrahman Aldossary, Raya Al-Dadah and Saad Mahmoud</i>	81: Numerical Investigation of the Thermal Performance of Water Based Closed Loop Oscillating Heat Pipe (CLOHP) <i>Siegfried Yeboah and Jo Darkwa</i>	329: Computational Investigation of Unsteady Conjugated Heat Transfer in Microchannel Active magnetic Regenerator <i>Muhammad Sajid Kamran, Jie Sun, Hassan Ali, Hu Zhang, Yi Long and Hua Sheng Wang</i>
308: Energy performance assessment of market available photovoltaic module technologies under Kuwait climate condition <i>Ahmed Hamza H Ali and Hassan M.G. Alfidhli</i>	406: A Study on the Optical Separation of Highly Concentrated Solar Radiation Using Hot Mirror <i>Yeongmin Kim, Young Soo Lee, Seung Jin Oh and Wongee Chun</i>	88: The environmental impact of thermal discharge of warm water from a heat pump in commercial building to a canal <i>Pomput Jarumongkonsak, Shenyi Wu and Yuying Yan</i>	363: Building applications of heat recovery systems: A review <i>Pinar Mert Cuce, Kemal Gani Bayraktar, Saffa Riffat and Siddig Omer</i>
313: Investigation of the PV self-cleaning <i>Sami Alsaleh, Siddig Omer and Rabah Boukhanouf</i>	440: Off-design Thermodynamic Performances of a Typical Solar hybrid Coal-fired Power Plant in China <i>Hong Hui, Wei Han, Shuo Peng and Hongguang Jin</i>	171: Theoretical and Experimental Study of a Novel Adsorption Heat Storage Systems for Building Applications <i>Norhayati Mat Wajid, Omer Siddig, Riffat Saffa, Blaise Mompouo and Auwal Muktar Dodo</i>	460: Assessment methods for selecting organic absorbents of HFC refrigerant in absorption system <i>Wenjie Guan, Zhangzhang Yang, Hanru Yu, Xiaogang Qiao, Xiaohong Han and Guangming Chen</i>
321: Heat Transfer and Fluid Flow Studies in Helical-Spiral Coils of Modified Cavity Receiver for Solar Dish Process Heat System <i>K. S. Reddy and T Srihari Vikram</i>	485: Economic and Environmental Analyses of a BIPV-PCM-slurry Based Energy System <i>Zhongzhu Qiu, Xudong Zhao, Xiaoli Ma and Peng Li</i>	235: Preliminary performance investigation of a novel direct contact evaporative cooling system <i>Pinar Mert Cuce, Kemal Gani Bayraktar, Saffa Riffat and Siddig Omer</i>	171: Theoretical and Experimental Study of a Novel Adsorption Heat Storage Systems for Building Applications <i>Norhayati Mat Wajid, Omer Siddig, Riffat Saffa, Blaise Mompouo and Auwal Muktar Dodo</i>
354: Improving illumination and temperature distribution uniformity in high concentrating solar cells <i>Abdulrahman Aldossary, Abdulmaged Algareu, Adel Aldihani, Raya Al-Dadah and Saad Mahmoud</i>	488: Research on the development of a small-scale supercritical carbon dioxide power cycle experimental loop with a high-speed turbo-generator <i>Junhyun Cho, Ho-Sang Ra, Gilbong Lee, Hyungki Shin and Young-Jin Baik</i>	260: A Review on Desiccant Cooling System <i>Khalid Alsaleh and Saffa Riffat</i>	

Poster Session D

Wednesday 26th August 14:50hrs, Osbourne Suite and Syndicate Rooms

99: Embodied Energy of Fired Bricks: The Case of Uganda and Tanzania <i>Arman Hashemi and Heather Cruickshank</i>	198: A study on the development of measuring equipment of the solar heat gain performance by use a natural sunlight <i>Seok-Hyun Kim, Sang-Hoon Lim and Soo Cho</i>	402: A Case Study of Energy Efficiency Retrofit and Renewable Technology Utilisation in a UK Schools Group <i>Li Zhang, Yuehong Su and Meng Tian</i>	83: Simulation of thermal performance of laminated microencapsulated multiphase change material in buildings <i>Weiguang Su, Jo Darkwa and Georgios Kokogiannakis</i>
111: A Design Study of an Amphitheatre in Delphi: Nuances of Form, Fabric and Soundscape <i>Satyajit Ghosh, Rahul Harimohan Pillai, R. Anand Murali, Amitesh Roy and Saif UI Haque</i>	210: Optimising housing design to reduce energy efficiency dependency in Jordan <i>Heba Nazer and Lucelia Rodrigues</i>	296: Thermal environment of an atrium enclosed with an ETFE foil cushion envelope <i>Sabrina Afrin, John Chilton and Benson Lau</i>	84: Research on PCM Thermal Storage Structure of the Size and Mixing Melting Points Sphere Packing <i>Guohua Wang, Qing Gao, Chun Gao, Wenlong Xu, Tianshi Zhang and Y.Y. Yan</i>
121: Investigating the Role of Façade Design in Improving Energy Efficiency for Residential Tall Buildings in Saudi Arabia <i>Noura Ghabra, Oldfield Philip and Lucelia Rodrigues</i>	281: Occupant Behaviour and Thermal Comfort in Naturally Ventilated Office Buildings in China Field Study in Zhejiang <i>Jindong Wu, Lucelia Taranto Rodrigues and Brian Ford</i>	476: Integrated Smart Indoor – Outdoor Web based Energy Management System for University Campuses <i>Konstantina Vasilakopoulou and Kostas Gombakis</i>	173: Potential Integration of Sustainable Technologies in Office Building in Ghana: exploratory research <i>Eunice Akyereko Adjei, Siddig Omer and Yupeng Wu</i>
159: Methodology of Energy Monitoring and Assessment of the Energy Saving due to the Building Retrofit <i>Blaise Mompouo and Saffa Riffat</i>	285: Impact of weather climate on minimizing dehumidifying load on air conditioned office <i>Eunice Akyereko Adjei, Saffa Riffat and Siddig Omer</i>	56: Method theory research on determining the phase-change temperature arrange of PCM integrated into building envelopes <i>Xi Meng, Wei Zhang, Caixia Wang, Yanru Li and Enshen Long</i>	184: The Studies of Developing teaching materials on Applications of Nano-technology on Energy Education in Taiwan Elementary Schools <i>Chien-Kuo Ku and Chia-Ling Wei</i>
167: Development of an energy simulation software for high-tech fabrication plants (Fab): theoretical model and verificatio <i>Ti Lin, Shih-Cheng Hu Hu and Yi-Yun Cheng</i>	306: Resource potential and energy efficiency in the building of Cameroon - A review <i>Modeste Kameni Nematchoua, Blaise Mompouom and Tchinda Rene</i>	73: Numerical study on laminar heat transfer and pressure drop of Phase Change Material Emulsion (PCME) in Coiled Tubes <i>Jingjing Shao, Jo Darkwa and Georgios Kokogiannakis</i>	

14th International Conference on Sustainable Energy Technologies

25th - 27th of August 2015, Nottingham, UK



Conference Programme - Day 3 Thursday 27th August

09:00	Keynote Speaker 5: Professor Chi-Hwa Wang Challenges on the Co-gasification of Woody Biomass and Solid Waste: A Singapore Story on Waste Minimization and Energy Chair: Professor Saffa Riffat <i>Great Hall</i>			
	Session 29: Low-carbon/ Low-energy Technologies <i>Great Hall</i> Chair: Jin Hu	Session 30: Heating and Cooling System <i>Balmoral Gallery</i> Chair: Muhyiddine Jradi	Session 31: Energy Efficiency in Buildings <i>City Suite</i> Chair: Jenny White	Session 32: Heat Pumps <i>Osborne Lounge</i> Chair: Alexandra Grekova
10:00	166: Numerical Simulation of a Hybrid Concentrated Solar Power/Biomass Mini Power Plant <i>João Soares and Armando Oliveira</i>	53: A study on the effect of ground surface boundary conditions in modelling shallow ground heat transfer <i>Marco Bortoloni, Michele Bottarelli and Yuehong Su</i>	90: Photovoltaic ventilated façade as an energy efficient measure for building retrofitting <i>Teodosio Del Caño, Elena Rico, Isabel Sánchez, César Porras and David Martín Jiménez</i>	143: An irreversibility analysis of the air to air heat pump <i>Saban Tamdemir and Ali Kilcarslan</i>
10:20	107: Plutonium Utilization in HTGR with ThO ₂ Fuel <i>Abdul Waris, Syeilendra Pramuditya, Sidik Permana and Zaki Su'Ud</i>	297: Soil Temperature Profile of new cities in Egypt <i>Ahmed A.Serageldin, Ali K. Abdel Rahman, Ahmed Hamza H. Ali, Mohamed R.O.Ali and Shinichi Ookawara</i>	146: Study on Green retrofit diagnosis method for existing building <i>Suzhen Ma and Jinjin Sun</i>	393: Study on performance of multiple air source heat pump system for heating in China <i>Weili Luo, Yunkang Sun, Yuxiong Xu and Ruzhu Wang</i>
10:40	38: Sustainability aspect of nuclear fuel from loading recycled spent fuel in fast breeder reactor (FBR) <i>Sidik Permana, Abdul Waris, Mitsutoshi Suzuki and Masaki Saito</i>	383: Numerical investigation of heat transfer in the vertical tube of a supercritical water solar receiver <i>Guang Zhang, Yong Li, Yanjun Dai and Ruzhu Wang</i>	179: A case for application of vacuum insulated panels (VIPs) in high-income area solid wall buildings <i>David Tetlow, Lia De-Simon and Saffa Riffat</i>	388: A comparison study on direct expansion solar assisted heat pump water heater system with different channel pattern roll-bond collectors/evaporators <i>Yanjun Dai, Jinfeng Chen and Ruzhu Wang</i>
11:00	Coffee Break & Poster Session E <i>Osborne Suite</i>			
	Session 33: Low-carbon/ Low-energy Technologies <i>Great Hall</i> Chair: Hongxing Yang	Session 34: Carbon Sequestration <i>Balmoral Gallery</i> Chair: Dick Powell	Session 35: Energy Efficiency in Buildings <i>City Suite</i> Chair: David Tetlow	Session 36: Low-carbon/ Low-energy Technologies <i>Osborne Lounge</i> Chair: Andrew C Eloka-Eboka
11:30	439: Domestic Turbine Design, Simulation and Manufacturing for Sub-Saharan Africa Energy Sustainability <i>Williams Ebhota and Freddie L. Inambao</i>	62: Carbon Neutral Fuel <i>Tony Marmont</i>	181: Calibration of the simulation model of the herb building in bologna in its present state <i>Enzo Zanchini, Claudia Naldi, Stefano Lazzari, Stefania Falcioni and Gian Luca Morini</i>	55: Heating and cooling performance of a minitype ground source heat pump system <i>Xiaoqiang Zhai and Ruzhu Wang</i>
11:50	216: AirAid: An alternative for harnessing Wind Energy using Venturi effect for low-wind regimes <i>Vishal Ramesh, Morapakala Srinivas and Nikhil Agarwal</i>	246: Carbon pump: A reinterpreting model for energy efficiency of CO ₂ capture <i>Shuai Deng, Ruikai Zhao, Yinan Liu and Li Zhao</i>	149: Passive and Active Solutions to Improve the Energetic Efficiency of Buildings <i>Clito Afonso and Ricardo Pereira</i>	244: Experimental study on a direct-expansion solar-assisted heat pump <i>Wenzhu Huang, Jie Ji, Ning Xu, Haofang Zheng and Fangliang Zhao</i>
12:10	257: Renewable Energy Potential Maps for Building Thermal Design in China <i>Siqiang Lu, Kazuo Emura, Jun Wang, Feng Xiong and Ming Quan</i>	312: Kinetics of direct CO ₂ capture from ambient air using K ₂ CO ₃ /Al ₂ O ₃ composite sorbent <i>Zhanna Veselovskaya, Vladimir Derevshikov and Aleksey Okunev</i>	236: Investigating the effect of tightening residential envelopes in the Mediterranean region <i>Georgios Georgiou, Mahroo Eftekhari and Tom Lupton</i>	480: Potential of Biogas Recovery from Landfills for Sustainable Energy Production: A Case Study from Jordan <i>Hani Qdais</i>
12:30	Packed Lunch <i>Osborne Suite</i>			

Poster Session E

Thursday 27th August 11:00hrs, Osbourne Suite and Syndicate Rooms

98: A study on use of three-dimensional miniature dielectric compound parabolic concentrator (dCPC) for daylighting control application <i>Meng Tian and Yuehong Su</i>	221: An experimental study of the thermoelectric properties of Oriental hornet silks and their application in buildings <i>Mark Worall, Bianca Laura Latini, Theo Elmer and Rabah Boukhanouf</i>	147: Case Study on Korean Style Ecological Architecture <i>Sanghoon Lim</i>	287: Running performance of air-source heat pump applied in low-temperature region of north China <i>Songhui Ai and Wenxing Shi</i>
124: The Application of Vernacular Australian Environmental Design Principles on Contemporary Housing. Lessons Learnt from the Marie-Short House by Glenn Murcutt <i>Mauricio Lecaro, Lucelia Rodrigues and Benson Lau</i>	225: Recent development in polymer heat exchangers <i>Xiangjie Chen, Yuehong Su and Saffa Riffat</i>	172: The influence of the primary refrigerant thermo-physical properties on the performance of a domestic air source heat pump water heater <i>Stephen Tangwe, Michael Simon and Edson Meyer</i>	486: Research on the Compressor Test Rig for Refrigerant Drop-in Experiment <i>Gilbong Lee, Joo-Sang Kim, Junhyun Cho, Ho-Sang Ra and Young-Soo Lee</i>
163: Development of Timber Structure and Green Building in China <i>Li Xiaoyang, Xie Shangqun, Wang Qingqin and Cheng Zhijun</i>	417: Sustainable and Renewable Energy Architectural Initiatives for COMSATS Institute of Information Technology Islamabad Campus <i>Adnan Amin and Adnan Amin</i>	211: Investigation on the Performance of Air Source Heat Pump System with new Environment Friendly Refrigerants for a Low Carbon Building <i>Yate Ding, Erdem Cuce, Saffa Riffat and Chungui Lu</i>	
213: Architectural Design Principles for Passive Cooling in Cyprus Climate <i>Pervin Abohorlu and Saffa Riffat</i>	377: Lighting performance investigation of heat insulation solar glass (HISG) for potential utilization in greenhouses as facade material <i>Erdem Cuce, Saffa Riffat and Chin-Huai Young</i>	385: Modulating vs on/off heat pump systems for residential heating: sizing strategies based on an annual energy analysis <i>Marco Noro, Renato Lazzarin and Giacomo Bagarella</i>	

Key	
	Energy Technology & Renewables
	Energy Storage & Conversion
	Sustainable Cities & Environment
	Policies & Management