

8th International Conference on Sustainability in Energy and Buildings (SEB-16)

Energy Procedia Volume 111

Turin, Italy
11 – 13 September 2016

Part 1 of 2

Editors:

**Robert Howlett
Alfonso Capozzoli
Valentina Serra**

ISBN: 978-1-5108-3984-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PART 1

EDITORIAL TO THE PROCEEDINGS OF THE 8TH INTERNATIONAL CONFERENCE ON SUSTAINABILITY IN ENERGY AND BUILDINGS (SEB 2016)	1
<i>Alfonso Capozzoli, Valentina Serra</i>	
METHODOLOGIES FOR SUPPORTING SUSTAINABILITY IN ENERGY AND BUILDINGS. THE CONTRIBUTION OF PROJECT ECONOMIC EVALUATION	2
<i>E. Fregonara</i>	
MODEL-BASED OPTIMIZATION OF GROUND SOURCE HEAT PUMP SYSTEMS	12
<i>Zhenjun Ma, Lei Xia</i>	
A PARAMETRIC TOOL FOR THE ASSESSMENT OF OPERATIONAL ENERGY USE, EMBODIED ENERGY AND EMBODIED MATERIAL EMISSIONS IN BUILDING	21
<i>Nicola Lolli, Selamawit Mamo Fufa, Marianne Inman</i>	
A MECHANICAL AND ENVIRONMENTAL ASSESSMENT AND COMPARISON OF BASALT FIBRE REINFORCED POLYMER (BFRP) REBAR AND STEEL REBAR IN CONCRETE BEAMS	31
<i>Marianne Inman, Eythor Rafn Thorhallsson, Kamal Azrague</i>	
AN EXPEDITIOUS METHOD FOR COMPARING SUSTAINABLE RATING SYSTEMS FOR RESIDENTIAL BUILDINGS	41
<i>Stefano Politi, Ernesto Antonini</i>	
BIO-INSPIRED HEAT DISSIPATION SYSTEM INTEGRATED IN BUILDINGS: DEVELOPMENT AND APPLICATIONS	51
<i>Amaia Zuazua-Ros, César Martín-Gómez, Juan Carlos Ramos, Tomás Gómez-Acebo</i>	
EXPLORING ENERGY MODELLING IN ARCHITECTURE LOGICS OF INVESTMENT AND RISK	61
<i>Sonja Oliveira, Elena Marco, Bill Gething, Craig Robertson</i>	
ISSUES TO BE IMPROVED ON THE THERMAL PERFORMANCE STANDARDS FOR SUSTAINABLE BUILDINGS CONSOLIDATION: AN OVERVIEW OF BRAZIL	71
<i>Raquel Diniz Oliveira, Roberta Vieira Gonçalves De Souza, Roberto M. Da Silva</i>	
MULTIFUNCTIONAL ANALYSIS OF INNOVATIVE PCM-FILLED CONCRETES	81
<i>Anna Laura Pisello, Antonella D'Alessandro, Claudia Fabiani, Alessandro Pio Fiorelli, Filippo Ubertini, Luisa F. Cabeza, Annibale Luigi Materazzi, Franco Cotana</i>	
RESIDENTIAL BUILDING RETROFIT THROUGH NUMERICAL SIMULATION: A CASE STUDY	91
<i>Ermanno Lo Cascio, Zhenjun Ma, Davide Borelli, Corrado Schenone</i>	
RESEARCH OF DESIGN FEATURES THAT INFLUENCE ENERGY CONSUMPTION IN OFFICE BUILDINGS IN BELO HORIZONTE, BRAZIL	101
<i>Ana Carolina De Oliveira Veloso, Roberta Vieira Gonçalves De Souza, Ricardo Nicolau Nassar Koury</i>	
THERMAL PERFORMANCE OF SOCIAL HOUSING– A STUDY BASED ON BRAZILIAN REGULATIONS	111
<i>Ana Cecília Rodrigues Moreno, Ingrid Stephanie De Moraes, Robertavieira Gonçalves De Souza</i>	
FIRST STEPPING STONES OF ALTERNATIVE REFURBISHMENT MODULAR SYSTEM LEADING TO ZERO ENERGY BUILDINGS	121
<i>Petr Hejtmánek, Martin Volf, Katerina Sojková, Radek Brandejs, Michal Kabrhel, Michal Bejcek, Erik Novák, Antonín Lupíšek</i>	
REFLECTIONS ABOUT THE USE OF THE TOOL S3E FOR THE EVALUATION OF ENERGY EFFICIENCY LEVEL IN COMMERCIAL BUILDINGS IN BRAZIL	131
<i>Marina Da Silva Garcia, Roberta Vieira Gonçalves De Souza</i>	
EVALUATION OF CAE METHODS USED FOR PLATE HEAT EXCHANGER DESIGN	141
<i>Václav Dvorský, Tomáš Vít</i>	
A NOVEL PHOTO-BIOREACTOR APPLICATION FOR MICROALGAE PRODUCTION AS A SHADING SYSTEM IN BUILDINGS	151
<i>Simonetta L. Pagliolico, Valerio R. M. Lo Verso, Francesca Bosco, Chiara Mollea, Cinzia La Forgia</i>	
CLUSTERING OF HOUSEHOLD OCCUPANCY PROFILES FOR ARCHETYPE BUILDING MODELS	161
<i>Giuseppina Buttitta, William Turner, Donal Finn</i>	
IMPROVING THERMAL COMFORT AND INDOOR AIR QUALITY THROUGH MINIMAL INTERVENTIONS IN OFFICE BUILDINGS	171
<i>Narguess Khatami, Arman Hashemi</i>	

EVALUATION OF THE SPACE HEATING CALCULATIONS WITHIN THE IRISH DWELLING ENERGY ASSESSMENT PROCEDURE USING SENSOR MEASUREMENTS FROM RESIDENTIAL HOMES	181
<i>Geoff Hunter, Seamus Hoyne, Liam Noonan</i>	
ASSESSMENT OF THE INNER SKIN COMPOSITION IMPACT ON THE DOUBLE-SKIN FAÇADE ENERGY PERFORMANCE IN THE MEDITERRANEAN CLIMATE	195
<i>Ines Khalifa, Leila Gharbi-Ernez, Essia Znouda, Chiheb Bouden</i>	
A DESIGN STRATEGY TO REACH NZEB STANDARDS INTEGRATING ENERGY EFFICIENCY MEASURES AND PASSIVE ENERGY USE	205
<i>Fausto Barbolini, Paolo Cappellacci, Luca Guardigli</i>	
NEXUS WATER ENERGY FOR HOTEL SECTOR EFFICIENCY	215
<i>Armando Pinto, Armando Silva Afonso, António Silva Santos, Carla Pimentel-Rodrigues, Fernanda Rodrigues</i>	
SIMULATION BASED ANALYSIS ON THE ENERGY CONSERVATION EFFECT OF GREEN WALL INSTALLATION FOR DIFFERENT BUILDING TYPES IN A CAMPUS	226
<i>Sinchita Poddar, Dong Yoon Park, Seongju Chang</i>	
EFFECTS OF SOLAR SHADING ON THERMAL COMFORT IN LOW-INCOME TROPICAL HOUSING	235
<i>Arman Hashemi, Narguess Khatami</i>	
RETROFIT SCENARIOS AND ECONOMIC SUSTAINABILITY. A CASE-STUDY IN THE ITALIAN CONTEXT	245
<i>Elena Fregonara, Valerio R. M. Lo Verso, Matteo Lisa, Guido Callegari</i>	
DESIGN OF A NEW FULL-SCALE FACILITY FOR BUILDING ENVELOPE TEST: FACT (FACADE TOOL)	256
<i>Lorenza Bianco, Patrice Schneuwly, Etienne Wurtz, Adrien Brun</i>	
ENERGY EFFICIENT BUILDING HVAC CONTROL ALGORITHM WITH REAL-TIME OCCUPANCY PREDICTION	267
<i>Jie Shi, Nanpeng Yu, Weixin Yao</i>	
EXPLORING ENERGY CONSERVATION IN OFFICE BUILDINGS WITH THERMAL COMFORT CRITERION TOWARDS SUSTAINABLE NEW DEVELOPMENTS IN WARM AND HUMID CLIMATE	277
<i>Pradeep Kini, Naresh Kumar Garg, Kiran Kamath</i>	
FITNESS: SHEEP-WOOL AND HEMP SUSTAINABLE INSULATION PANELS	287
<i>R. Pennacchio, L. Savio, D. Bosia, F. Thiebat, G. Piccablotto, A. Patrucco, S. Fantucci</i>	
LIVING WALL SYSTEMS: A TECHNICAL STANDARD PROPOSAL	298
<i>Roberto Giordano, Elena Montacchini, Silvia Tedesco, Alessandra Perone</i>	
INFLUENCE OF ENVELOPE DESIGN IN THE OPTIMIZATION OF THE ENERGY PERFORMANCE OF A MULTI-FAMILY BUILDING	308
<i>Maria Ferrara, Elisa Strombo, Alberto Monti, Enrico Fabrizio, Marco Filippi</i>	
ASSESSMENT OF COST OPTIMAL SOLUTIONS FOR HIGH PERFORMANCE MULTI-FAMILY BUILDINGS IN IRAN	318
<i>Mohammadhossein Alvand, Zahra Gholami, Maria Ferrara, Enrico Fabrizio</i>	
INCREASE SUSTAINABILITY IN BUILDINGS THROUGH PUBLIC PROCUREMENTS: THE PROLITE PROJECT FOR LIGHTING RETROFIT IN SCHOOLS	328
<i>Elena Deambrogio, Silvia Allegretti, Piergiorgio Turi, Filippo Zuccarello, Pasquale Lariccia, Chiara Aghemo, Anna Pellegrino</i>	
A NEW METHODOLOGY FOR THE SELECTIVE MEASUREMENT OF BUILDING PERFORMANCE AND SAFETY	338
<i>J. R. Littlewood, M. Alam, S. Goodhew</i>	
WOOD FIBER VS SYNTHETIC THERMAL INSULATION FOR ROOFS ENERGY RETROFIT: A CASE STUDY IN TURIN, ITALY	347
<i>Lorenza Bianco, Riccardo Pollo, Valentina Serra</i>	
PHASE CHANGE MATERIALS IN GLAZING: IMPLICATIONS ON LIGHT DISTRIBUTION AND VISUAL COMFORT. PRELIMINARY RESULTS	357
<i>Luigi Giovannini, Francesco Goia, Valerio R. M. Lo Verso, Valentina Serra</i>	
EMBODIED ENERGY VERSUS OPERATIONAL ENERGY IN A NEARLY ZERO ENERGY BUILDING CASE STUDY	367
<i>Roberto Giordano, Valentina Serra, Enrico Demaria, Angela Duzel</i>	
GREEN SOLUTIONS- CLIMBING VEGETATION IMPACT ON BUILDING – ENERGY BALANCE ELEMENT	377
<i>Krzysztof Grabowiecki, Armen Jaworski, Tomasz Niewczas, Annamaria Belleri</i>	

ONE YEAR TEMPERATURE AND HEAT PUMP PERFORMANCE FOR A MICRO-COMMUNITY OF LOW CARBON DWELLINGS, IN WALES, UK.....	387
<i>J. R. Littlewood, I. Smallwood</i>	
REFURBISHING AN EXISTING APARTMENT BLOCK IN MEDITERRANEAN CLIMATE: TOWARDS THE PASSIVHAUS STANDARD	397
<i>Agata Consoli, Vincenzo Costanzo, Gianpiero Evola, Luigi Marletta</i>	
MATURITY MATRIX ASSESSMENT: EVALUATION OF ENERGY EFFICIENCY STRATEGIES IN BRUSSELS HISTORIC RESIDENTIAL STOCK.....	407
<i>Aránzazu Galán González, Miguel Ángel Gómez Zotano, William Swan, Philippe Bouillard, Hisham Elkadi</i>	
CASE-BASED REASONING AND TEXT MINING FOR GREEN BUILDING DECISION MAKING	417
<i>Xue Xiao, Martin Skitmore, Xin Hu</i>	
ENERGY RESILIENCE OF HISTORICAL URBAN DISTRICTS: A STATE OF ART REVIEW TOWARDS A NEW APPROACH.....	426
<i>Cantatore Elena, De Fino Mariella, Fatiguso Fabio</i>	
INNOVATIVE USE OF HYDROGEN IN ENERGY RETROFITTING OF LISTED BUILDINGS.....	435
<i>Benedetto Nastasi, Umberto Di Matteo</i>	
IMPACTS OF UNCERTAINTIES IN LIFE CYCLE COST ANALYSIS OF BUILDINGS ENERGY EFFICIENCY MEASURES: APPLICATION TO A CASE STUDY	442
<i>Elisa Di Giuseppe, Andrea Massi, Marco D'Orazio</i>	
THE RECURRENT CHARACTERISTICS OF HISTORIC BUILDINGS AS A SUPPORT TO IMPROVE THEIR ENERGY PERFORMANCES: THE CASE STUDY OF PALERMO.....	452
<i>Enrico Genova, Giovanni Fatta, Calogero Vinci</i>	
THE ENERGY SAVING AND INDOOR COMFORT IMPROVEMENTS WITH LATENT THERMAL ENERGY STORAGE IN BUILDING RETROFITS IN CANADA.....	462
<i>Umberto Berardi, Mauro Manca</i>	
THERMAL AND ACOUSTIC PROPERTIES OF AEROGELS: PRELIMINARY INVESTIGATION OF THE INFLUENCE OF GRANULE SIZE.....	472
<i>Elisa Moretti, Francesca Merli, Erdem Cuce, Cinzia Buratti</i>	
DESIGN DETAILS AND LONG-TERM PERFORMANCE OF VIPS IN CANADA'S NORTH	481
<i>Doug Maclean, Phalguni Mukhopadhyaya, Juergen Korn, Stephen Mooney</i>	
THE EFFECT OF TEMPERATURE ON THERMAL PERFORMANCE OF FUMED SILICA BASED VACUUM INSULATION PANELS FOR BUILDINGS.....	490
<i>Alice Lorenzati, Stefano Fantucci, Alfonso Capozzoli, Marco Perino</i>	
A STUDY ON THE USE OF OUTDOOR MICROCLIMATE MAP TO ADDRESS DESIGN SOLUTIONS FOR URBAN REGENERATION	500
<i>Jacopo Gaspari, Kristian Fabbri</i>	
OUTDOOR COMFORT: THE ENVI-BUG TOOL TO EVALUATE PMV VALUES OUTPUT COMFORT POINT BY POINT.....	510
<i>Kristian Fabbri, Antonello Di Nunzio, Jacopo Gaspari, Ernesto Antonini, Andrea Boeri</i>	
THERMAL COMFORT EVALUATION OF A MIXED-MODE VENTILATED OFFICE BUILDING WITH ADVANCED NATURAL VENTILATION AND UNDERFLOOR AIR DISTRIBUTION SYSTEMS	520
<i>Xiang Deng, Georgios Kokogiannakis, Zhenjun Ma, Paul Cooper</i>	
ON THE INTRINSIC FLEXIBILITY OF THE DOUBLE SKIN FAÇADE: A COMPARATIVE THERMAL COMFORT INVESTIGATION IN TROPICAL AND TEMPERATE CLIMATES.....	530
<i>Francesco Pomponi, Sabrina Barbosa, Poorang A. E. Piroozfar</i>	
TRACE ELEMENTAL COMPOSITION IN PM10 AND PM2.5 COLLECTED IN CARDIFF, WALES.....	540
<i>G. Mohammed, G. Karani, D. Mitchell</i>	

PART 2

ONSITE FOOD WASTE PROCESSING AS AN OPPORTUNITY TO CONSERVE WATER IN A MEDICAL FACILITY CASE STUDY, ABU DHABI	548
<i>G. Seguela, J. R. Littlewood, G. Karani</i>	
'TOO MANY EMPTY HOMES, TOO MANY HOMELESS' – A NOVEL DESIGN AND PROCUREMENT FRAMEWORK FOR TRANSFORMING EMPTY HOMES THROUGH SUSTAINABLE SOLUTIONS	558
<i>Boris Ceranic, Graham Markwell, Angela Dean</i>	

OVERHEATING IN A UK HIGH-RISE RETROFIT APARTMENT BLOCK – RANKING OF MEASURES AVAILABLE TO CASE STUDY OCCUPANTS BASED ON MODELLING	568
<i>Magdalena Baborska-Narozny, Magdalena Grudzinska</i>	
COOL, TRANSLUCENT NATURAL ENVELOPE: THERMAL-OPTICS CHARACTERISTICS EXPERIMENTAL ASSESSMENT AND THERMAL-ENERGY AND DAY LIGHTING ANALYSIS	578
<i>Federica Rosso, Anna Laura Pisello, Franco Cotana, Marco Ferrero</i>	
SUMMER DISCOMFORT REDUCTION BY DIRECT EVAPORATIVE COOLING IN SOUTHERN MEDITERRANEAN AREAS.....	588
<i>Giacomo Chiesa, Nora Huberman, David Pearlmutter, Mario Grosso</i>	
PASSIVE DOWNDRAUGHT EVAPORATIVE COOLING SYSTEM INTEGRATION IN EXISTING RESIDENTIAL BUILDING TYPOLOGIES: A CASE STUDY	599
<i>Giacomo Chiesa, Mario Grosso, Alessio Bogni, Giacomo Garavaglia</i>	
THERMAL PERFORMANCE OF AN OFFICE CUBICLE INTEGRATED WITH A BIO-BASED PCM: EXPERIMENTAL ANALYSES	609
<i>Tor A. Vik, Habtamu B. Madessa, Petter Aslaksrud, Eirik Folkedal, Ottar S. Øvrevik</i>	
THERMAL PERFORMANCE ASSESSMENT OF AN OPAQUE VENTILATED FAÇADE IN THE SUMMER PERIOD: CALIBRATION OF A SIMULATION MODEL THROUGH IN-FIELD MEASUREMENTS	619
<i>Stefano Fantucci, Cosimo Marinosci, Valentina Serra, Corrado Carbonaro</i>	
DEVELOPING A BUILDING ENERGY EFFICIENCY ASSESSMENT TOOL FOR OFFICE BUILDINGS IN GHANA: DELPHIC CONSULTATION APPROACH.....	629
<i>Addy Michael Nii, Adinyira Emmanuel, Ayarkwa Joshua</i>	
USING INTELLIGENT BUILDING ENERGY MANAGEMENT SYSTEM FOR THE INTEGRATION OF SEVERAL SYSTEMS TO ONE OVERALL MONITORING AND MANAGEMENT SYSTEM.....	639
<i>Sotiris Papantoniou, Stefano Mangili, Ivan Mangialenti</i>	
ENERGY ANALYSIS OF A TRANSCRITICAL CO2 SUPERMARKET REFRIGERATION SYSTEM WITH HEAT RECOVERY.....	648
<i>Alessio Polzot, Paola D'Agaro, Giovanni Cortella</i>	
ATTENTION GUIDANCE, PERCEIVED BRIGHTNESS AND ENERGY DEMAND IN RETAIL LIGHTING	658
<i>Andreas Ampenberger, Siegmund Staggl, Wilfried Pohl</i>	
VENTILATIVE COOLING IN SHOPPING CENTERS' RETROFIT: THE MERCADO DEL VAL CASE STUDY	669
<i>Annamaria Belleri, Marta Avantaggiato, Roberto Lollini</i>	
OUTDOOR LIGHTING SYSTEM UPGRADING BASED ON SMART GRID CONCEPT.....	678
<i>Aleksandra A. Filimonova, Tatyana A. Barbasova, Dmitry A. Shnayder</i>	
IMPACT OF ENERGY EFFICIENT TECHNOLOGIES ON RESIDENTIAL CO2 EMISSIONS: A COMPARISON OF KOREA AND CHINA	689
<i>Chan Park, Rui Xing, Tatsuya Hanaoka, Yuko Kanamori, Toshihiko Masui</i>	
ENERGY, ENVIRONMENTAL AND ECONOMIC EFFECTS OF ELECTRIC VEHICLE CHARGING ON THE PERFORMANCE OF A RESIDENTIAL BUILDING-INTEGRATED MICRO-TRIGENERATION SYSTEM	699
<i>Antonio Rosato, Sergio Sibilio, Giovanni Ciampi, Evgueniy Entchev, Hajo Ribberink</i>	
HEAT SUPPLY MODES OPTIMIZATION BASED ON MACROMODELING TECHNOLOGY.....	710
<i>Aleksandra A. Filimonova, Tatyana A. Barbasova, Dmitry A. Shnayder, Aleksandr A. Basalaev</i>	
CONNECTING THE LAST MILE: DEMAND RESPONSE IN SMART BUILDINGS.....	720
<i>Tao Cui, Joseph Carr, Alexander Brissette, Enrico Ragaini</i>	
THE SECOND LAW AND THE ENERGY USE MAPPING FOR SUSTAINABILITY PLANNING	730
<i>Marta Giulia Baldi, Grazzini Giuseppe</i>	
ESTIMATING THE POTENTIAL FOR THERMAL LOAD MANAGEMENT IN BUILDINGS AT A LARGE SCALE: OVERCOMING CHALLENGES TOWARDS A REPLICABLE METHODOLOGY	740
<i>Solène Goy, Araz Ashouri, François Maréchal, Donal Finn</i>	
A DATA-DRIVEN APPROACH TO ASSESS THE POTENTIAL OF SMART CITIES: THE CASE OF OPEN DATA FOR BRUSSELS CAPITAL REGION.....	750
<i>Miguel Angel Gomez Zotano, Hugues Bersini</i>	
INSIGHTS ON SMART HOME CONCEPT AND OCCUPANTS' INTERACTION WITH BUILDING CONTROLS.....	759
<i>Valentina Fabi, Giorgia Spiglianini, Stefano Paolo Corgnati</i>	

A REVIEW ON INTERNET OF THINGS SOLUTIONS FOR INTELLIGENT ENERGY CONTROL IN BUILDINGS FOR SMART CITY APPLICATIONS	770
<i>Iman Khajenasiri, Abouzar Estebarsari, Marian Verhelst, Georges Gielen</i>	
A NOVEL INTEGRATED REAL-TIME SIMULATION PLATFORM FOR ASSESSING PHOTOVOLTAIC PENETRATION IMPACTS IN SMART GRIDS	780
<i>Lorenzo Bottaccioli, Abouzar Estebarsari, Edoardo Patti, Enrico Pons, Andrea Acquaviva</i>	
ADAPTIVE STREET LIGHTING PREDICTIVE CONTROL.....	790
<i>Francesco Marino, Fabio Leccese, Stefano Pizzuti</i>	
A DECISION SUPPORT FRAMEWORK FOR SMART CITIES ENERGY ASSESSMENT AND OPTIMIZATION	800
<i>Ilias Papastamatiou, Vangelis Marinakis, Haris Doukas, John Psarras</i>	
SMARTAINABILITY: A METHODOLOGY FOR ASSESSING THE SUSTAINABILITY OF THE SMART CITY	810
<i>Pierpaolo Girardi, Andrea Temporelli</i>	
THE USE OF MULTI-DETAIL BUILDING ARCHETYPES IN URBAN ENERGY MODELLING	817
<i>Claudia Sousa Monteiro, André Pina, Carlos Cerezo, Christoph Reinhart, Paulo Ferrão</i>	
ENABLING ENERGY SMART CITIES THROUGH URBAN SHARING ECOSYSTEMS	826
<i>Maurilio Zuccalà, Emiliano Sergio Verga</i>	
EUROPEAN CITIES CHARACTERIZATION AS BASIS TOWARDS THE REPLICATION OF A SMART AND SUSTAINABLE URBAN REGENERATION MODEL	836
<i>Miguel Á. García-Fuentes, Ana Quijano, Cristina De Torre, Rubén García, Philippe Compere, Christelle Degard, Isabel Tomé</i>	
MONET: AN INNOVATIVE SYSTEM TO MANAGE ENERGY SERVICES	846
<i>Maurizio Bigoloni, Sara Filipponi</i>	
SUSTAINABLE ENERGY IN CITIES: METHODOLOGY AND RESULTS OF A SUMMER COURSE PROVIDING SMART SOLUTIONS FOR A NEW DISTRICT IN SHANGHAI.....	856
<i>Wang Yu, Gabriele Lobaccaro, Salvatore Carlucci, Wang Ruzhu, Yong Li, Luca Finocchiaro, Dai Yanjun, Trygve Magne Eikevik, Annemie Wyckmans</i>	
AN EXERGY ANALYSIS FOR MILANO SMART CITY	867
<i>Francesco Causone, Andrea Sangalli, Lorenzo Pagliano, Salvatore Carlucci</i>	
EFFECT OF BIODIESEL-WATER-AIR DERIVED FROM BIODIESEL CRUDE PALM OIL USING PREMIX INJECTOR AND MIXTURE FORMATION IN BURNER COMBUSTION.....	877
<i>Amir Khalid, Mirnah Suardi, Ronny Yii Shi Chin, Shahrin Hisham Amirnordin</i>	
A NUMERICAL CASE STUDY: BOVET APPROACH TO DESIGN A FRANCIS TURBINE RUNNER.....	885
<i>Eyup Kocak, Salih Karaaslan, Nuri Yucel, Furkan Arundas</i>	
A COLLABORATIVE APPROACH TO OPERATE HIGH POWERED DEVICES ON SMALL-SCALE PV SYSTEMS	895
<i>Qasim Khalid, Jahangir Ikram, Naveed Arshad</i>	
APPLICATIONS OF HYBRID PHOTOVOLTAIC MODULES WITH THERMOELECTRIC COOLING.....	904
<i>Diana Enescu, F. Spertino</i>	
REAL TIME FAULT DETECTION IN PHOTOVOLTAIC SYSTEMS	914
<i>Mohamed Hassan Ali, Abdelhamid Rabhi, Ahmed El Hajjaji, Giuseppe M. Tina</i>	
A NEW MPPT-BASED ANN FOR PHOTOVOLTAIC SYSTEM UNDER PARTIAL SHADING CONDITIONS	924
<i>Loubna Bouselham, Mohammed Hajji, Bekkay Hajji, Hicham Bouali</i>	
AN ENERGY FLOW MANAGEMENT ALGORITHM FOR A PHOTOVOLTAIC SOLAR HOME	934
<i>Fathia Chekired, Zoubeyr Smara, Achour Mahrane, Madjid Chikh, Smail Berkane</i>	
TECHNIQUES AND EXPERIMENTAL RESULTS FOR PERFORMANCE ANALYSIS OF PHOTOVOLTAIC MODULES INSTALLED IN BUILDINGS.....	944
<i>F. Spertino, J. Ahmad, A. Ciocia, P. Di Leo</i>	
OPTIMIZATION OF SCALING FACTORS OF FUZZY-MPPT CONTROLLER FOR STAND-ALONE PHOTOVOLTAIC SYSTEM BY PARTICLE SWARM OPTIMIZATION	954
<i>Arfaoui Jouda, Feki Elyes, Abdelhamid Rabhi, Mami Abdelkader</i>	
EMBEDDING PASSIVE INTELLIGENCE INTO BUILDING ENVELOPES: A REVIEW OF THE STATE-OF-THE-ART IN INTEGRATED PHOTOVOLTAIC SHADING DEVICES	964
<i>Yahya Ibraheem, Eric R. P. Farr, Poorang A. E. Piroozfar</i>	
A REVIEW OF THE DUTCH ECOSYSTEM FOR BUILDING INTEGRATED PHOTOVOLTAICS	974
<i>Floor J. W. Osseweijer, Linda B. P. Van Den Hurk, Erik J. H. M. Teunissen, Wilfried G. J. H. M. Van Sark</i>	
ENERGY OPTIMIZATION OF BIPV GLASS BLOCKS: A MULTI-SOFTWARE STUDY	982
<i>Marco Morini, Rossella Corrao</i>	

STATUS AND OUTLOOK FOR BUILDING INTEGRATED PHOTOVOLTAICS (BIPV) IN RELATION TO EDUCATIONAL NEEDS IN THE BIPV SECTOR	993
<i>Momir Tabakovic, Hubert Fechner, Wilfried Van Sark, Atse Louwen, George Georghiou, George Makrides, Eliza Loucaidou, Monica Ioannidou, Ingrid Weiss, Sofia Arancon, Stephanie Betz</i>	
REAL TIME STUDY OF P&O MPPT CONTROL FOR SMALL WIND PMSG TURBINE SYSTEMS USING ARDUINO MICROCONTROLLER	1000
<i>Badreddine Lahfaoui, Smail Zougar, Bourhaleb Mohammed, Mohamed Larbi Elhafyani</i>	
DEVELOPMENT OF AN EQUILIBRIUM-BASED MODEL OF GASIFICATION OF BIOMASS BY ASPEN PLUS	1010
<i>A. Gagliano, F. Nocera, M. Bruno, G. Cardillo</i>	
ANALYSIS AND CHARACTERIZATION OF FAULTS IN PV PANELS.....	1020
<i>Bechara Nehme, Nacer K. Msirdi, Aziz Namaane, Tilda Akiki</i>	
RENEWABLE ENERGY MANAGEMENT ALGORITHM FOR A WATER PUMPING SYSTEM.....	1030
<i>I. Ouachani, A. Rabhi, I. Yahyaoui, B. Tidhaf, T. Fernando Tadeo</i>	
PARAMETRIC STUDY OF A VERTICALLY CONFIGURED GROUND SOURCE HEAT PUMP SYSTEM.....	1040
<i>Habtamu B. Madessa, B. Torger, Pål F. Bye, A. Erlend</i>	
ENERGY CONSUMPTION DATA AS A DECISION-MAKING TOOL FOR ENERGY EFFICIENT INTERVENTIONS IN PA: THE CASE-STUDY OF TURIN	1050
<i>Matteo Jarre, Sara Macagno, Michel Noussan</i>	
OPTIMIZATION TOOLS FOR BUILDING ENERGY MODEL CALIBRATION	1060
<i>Rigoberto Arambula Lara, Emanuele Naboni, Giovanni Pernigotto, Francesca Cappelletti, Yi Zhang, Furio Barzon, Andrea Gasparella, Piercarlo Romagnoni</i>	
ASSESSMENT OF BUILDING OPERATIONAL PERFORMANCE USING DATA MINING TECHNIQUES: A CASE STUDY	1070
<i>Cheng Fan, Fu Xiao</i>	
PREDICTING LARGE SCALE FINE GRAIN ENERGY CONSUMPTION	1079
<i>Tania Cerquitelli</i>	
Author Index	