

# **2019 10th International Renewable Energy Congress (IREC 2019)**

**Sousse, Tunisia  
26 – 28 March 2019**



**IEEE Catalog Number: CFP19REC-POD  
ISBN: 978-1-7281-0141-5**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19REC-POD
ISBN (Print-On-Demand):	978-1-7281-0141-5
ISBN (Online):	978-1-7281-0140-8
ISSN:	2378-3435

**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  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# TABLE OF CONTENTS

<b>CHARGING CONTROL OF AN ELECTRIC VEHICLE BATTERY BASED ON REINFORCEMENT LEARNING .....</b>	<b>1</b>
<i>Fangyuan Chang ; Tao Chen ; Wencong Su ; Qais Alsafasfeh</i>	
<b>OPTIMAL ENERGY CONTROL OF A PEM FUEL CELL/BATTERY STORAGE SYSTEM .....</b>	<b>7</b>
<i>Mohamed Derbeli ; Asma Charaabi ; Oscar Barambones ; Lassaad Sbita</i>	
<b>IMPACT OF ADDING PHASE CHANGE MATERIAL IN THE HEAT SINK FOR COOLING LIGHT EMITTING DIODE .....</b>	<b>12</b>
<i>Sana Ben Salah ; Mohamed Bechir Ben Hamida</i>	
<b>MAXIMUM POWER POINT TRACKING CONTROL USING NEURAL NETWORK FOR PHOTOVOLTAIC SYSTEMS .....</b>	<b>21</b>
<i>Mourad Talbi ; Olfa Makhoulf ; Nawel Mensia ; Hatem Ezzaouia</i>	
<b>DESIGN OF LOW ORDER ROBUST CONTROLLER USING THE ARTIFICIAL BEE COLONY ALGORITHM .....</b>	<b>27</b>
<i>Emad M. Mekheal ; Mohamed Zakaria ; Ragi A. Handy ; Medhat I. El Singaby</i>	
<b>EFFECT OF COLLECTION EFFICIENCY AND OXIDATION FACTOR ON ELECTRICITY GENERATION OF LANDFILL GAS TO ENERGY TECHNOLOGY .....</b>	<b>33</b>
<i>Temitope Raphael Ayodele ; Ayodeji Samson Ogunjuyigbe ; Josiah Lange Munda ; Moshood Akanni Alao</i>	
<b>AERODYNAMIC OPTIMIZATION OF COLD PRESERVATION ROOM DESIGN B .....</b>	<b>39</b>
<i>Zina Ghiloufi ; Tahar Khir</i>	
<b>EFFECT OF NANOPARTICLE'S SHAPE ON SOLAR POND EFFICIENCY .....</b>	<b>43</b>
<i>A. Labeled ; W. Louaer ; A. H. Meniai</i>	
<b>WIND-SOLAR POWER SYSTEM ASSOCIATED WITH FLYWHEEL AND PUMPED-HYDRO ENERGY STORAGE .....</b>	<b>49</b>
<i>C. Bendib ; M. Kesraoui</i>	
<b>PERFORMANCE ANALYSIS OF A STAND-ALONE SOLAR PV BATTERY SYSTEM FOR SUPPLYING LOW VOLTAGE RURAL CUSTOMERS IN SOUTH AFRICA .....</b>	<b>55</b>
<i>N. Ngubane ; S. Chowdhury</i>	
<b>OPTIMIZATION REFINERY PROCESSES TO MAXIMIZE GASOLINE PRODUCTION .....</b>	<b>61</b>
<i>Khaled M. Elmarimi ; Mohamed M. Alghiryani ; Huwaida Husein Swesi</i>	
<b>PERFORMANCE STUDY OF A CONCENTRATED PHOTOVOLTAIC THERMAL HYBRID SOLAR SYSTEM .....</b>	<b>70</b>
<i>Afffa Riahi ; Abdessalem Ben Haj Ali ; Amenallah Guizani ; Moncef Balghouthi</i>	
<b>PAPER SOLUBILITY OF TRILAURIN, TRIMYRISTIN AND TRIPALMITIN IN SUPERCRITICAL CARBON DIOXIDE .....</b>	<b>75</b>
<i>Bezaze Hassina ; Meniai Abdeslam-Hassen</i>	
<b>CONTROL STRATEGY OF A SMALL-SCALE WIND TURBINE GENERATION WITH STORAGE SYSTEM .....</b>	<b>80</b>
<i>Rim Ben Ali ; Salwa Bouadila ; Abdelkader Mami</i>	
<b>PERFORMANCE ANALYSIS OF TWO GAS TURBINE POWER PLANTS WITH DIFFERENT AIR PREHEATER DESIGN AND NUMERICAL SIMULATION OF THE PERFORMANT REGENERATOR .....</b>	<b>86</b>
<i>Abed Saria ; Khir Tahar</i>	
<b>ECONOMIC ANALYSIS OF SWRO DESALINATION PLANT DESIGN USING THREE DIFFERENT POWER SYSTEMS .....</b>	<b>92</b>
<i>Albashir Kh. Elfaqih ; Said O. Belhaj</i>	
<b>FRACTIONAL ORDER MODEL OF A GREENHOUSE WITH VARIED SOIL THERMAL CONDUCTIVITY .....</b>	<b>98</b>
<i>Zied Mhenni ; Mehdi Abbes ; Abdelkader Mami</i>	
<b>STUDIES AND SYNTHESIZES SULFONYLIMIDED POLY(PHENYLENE) MEMBRANES BY SUPER ACID-CATALYZED REACTION FOR PEMFC .....</b>	<b>104</b>
<i>Lei Jin ; Taewook Ryu ; Sujin Yoon ; Inhwan Choi ; Seungchan Lee ; Jaewoong Kim ; Whangi Kim</i>	
<b>OPTIMUM OPERATION PLANNING FOR A PVG/BATTERY STANDALONE INSTALLATION .....</b>	<b>109</b>
<i>Anoir Souissi ; Imen Guidara ; Maher Chaabene</i>	
<b>MODELING AND CONTROL OF A WIND TURBINE PLANT BASED ON DOUBLY FED INDUCTION GENERATOR .....</b>	<b>114</b>
<i>Sofien Tlijani ; Asma Meddeb ; Souad Chebbi</i>	

<b>SCENARIOS-BASED ENERGY DISPATCHING OF PVG/BATTERY/GRID-CONNECTED INSTALLATION.....</b>	<b>120</b>
<i>Imen Guidara ; Anoir Souissi ; Maher Chaabene</i>	
<b>THE EFFECT OF DESIGN PARAMETERS ON THE PERFORMANCE OF WATER HARVESTING SYSTEM .....</b>	<b>126</b>
<i>Ali J. Talib ; Abdul Hadi N. Khalifa ; Ahmed Q. Mohammed</i>	
<b>THEORETICAL STUDY OF THE NOVEL CONTROL STRATEGY OF HYBRID SOLAR AIR CONDITIONING SYSTEM.....</b>	<b>132</b>
<i>Ahmed Abed Mohmmmed ; Raed Ayad Abduljabbar</i>	
<b>A NEW SINGLE-INPUT DUAL-OUTPUT DC-DC CONVERTER MODELLED USING SMALL-SIGNAL AC APPROACH FOR MICRO-GRID APPLICATIONS.....</b>	<b>138</b>
<i>Rami Troudi ; Sandrine Moreau ; Gerard Champenois ; Monia Bouzid ; Khaled Jelassi</i>	
<b>A COMPARATIVE STUDY OF THREE CLASSIC FIVE-LEVEL INVERTERS CONNECTED TO THE POWER GRID .....</b>	<b>144</b>
<i>Rami Troudi ; Sandrine Moreau ; Gerard Champenois ; Monia Bouzid ; Khaled Jelassi</i>	
<b>INCREMENTAL CONDUCTANCE ALGORITHM OPTIMIZATION FOR A PHOTOVOLTAIC SYSTEM WITH FAST RESPONSE UNDER FAST-VARYING OF SOLAR POWER .....</b>	<b>150</b>
<i>Hamam M. Abd ; Emad A. Abdo ; Abdulhamed M. Jasim ; Ahmed M A Sabaawi</i>	
<b>INTEGRATED THERMAL ADEQUACY, SYSTEM INTELLIGENCE, AND RENEWABLE-ENERGY-ASSISTED SYSTEMS - TOWARDS SUSTAINABLE HEATING SYSTEMS IN JORDANIAN RESIDENTIAL SECTOR.....</b>	<b>156</b>
<i>Ahmad Almuhtady ; Ahmad Oweineh ; Issam Abdallah ; Hasan Rouqa ; Ahmad Alazzam ; Marwa Alfaouri</i>	
<b>A COMPARATIVE STUDY BETWEEN JORDANIAN OVERALL HEAT TRANSFER COEFFICIENT (U-VALUE) AND INTERNATIONAL BUILDING CODES.....</b>	<b>162</b>
<i>Ammar Alkhalidi ; Suhil Kiwan ; Haya Hamasha</i>	
<b>PERFORMANCE ANALYSIS OF MICRO-AMORPHE SILICON PV ARRAY UNDER ACTUAL CLIMATIC CONDITIONS IN NOUAKCHOTT, MAURITANIA .....</b>	<b>167</b>
<i>Jed Mohamed El Hacem ; Razika Ihaddadene ; Nabila Ihaddadene ; Cheikh Elbanany Elhadji Sidi ; Menny El Bah ; Pierre-Olivier Logerais</i>	
<b>DEEP MLP NEURAL NETWORK CONTROL OF BIOREACTOR .....</b>	<b>173</b>
<i>Latifa Belhaj Salah ; Fathi Fourati</i>	
<b>CONTROL SCHEME FOR STAND-ALONE DFIG FEEDING AN ISOLATED LOAD .....</b>	<b>178</b>
<i>Bilel Touaiti ; Hechmi Ben Azza ; Mohamed Jemli</i>	
<b>DESIGN OF GRID-CONNECTED CONVERTER CONTROL USING FUZZY LOGIC FOR WIND ENERGY CONVERSION SYSTEM.....</b>	<b>184</b>
<i>Loubna Benaouinate ; Mohamed Khafallah ; Abdelouahed Mesbahi ; Damien Voyer ; Tarik Bouragba</i>	
<b>PHOTOVOLTAIC SOLAR ENERGY APPLICATIONS IN LIBYA: A SURVEY.....</b>	<b>190</b>
<i>Shoroug Alweheshi ; Aisha Abdelali ; Zakariya Rajab ; Ashraf Khalil ; Faisal Mohamed</i>	
<b>SUSTAINABLE STREET LIGHTING SYSTEM DESIGN IN LIBYA.....</b>	<b>196</b>
<i>Abdelraouf Elmanfi ; Emad Elsharif ; Zakariya Rajab ; Ashraf Khalil ; Faisal Mohamed</i>	
<b>ACTIVE AND REACTIVE POWER CONTROL OF A GRID-CONNECTED PM WIND GENERATOR .....</b>	<b>202</b>
<i>Mohamed El-Mukhtar ; Ahmed Tahir ; Abdulhafid El-Faituri ; Faisal Mohamed</i>	
<b>OPTIMAL PROTECTION COORDINATION FOR IEC MICROGRID BENCHMARK USING WATER CYCLE ALGORITHM.....</b>	<b>208</b>
<i>Naser El Naily ; Saad. M. Saad ; Mohammed M. El Mislati ; Faisal A. Mohamed</i>	
<b>OLIVE MILL WASTEWATER CONTROLLED DRYING FOR MATERIAL AND WATER RECOVERY .....</b>	<b>214</b>
<i>P. Dutournié ; M. Jeguirim ; L. Limousy ; S. Jellali ; B. Khiari</i>	
<b>JAYA OPTIMIZATION APPROACH FOR PSSS AND TCSC BASED COORDINATED CONTROLLER DESIGN IN POWER SYSTEM.....</b>	<b>218</b>
<i>Yosra Welhazi ; Tawfik Guesmi ; Hsan Hadj Abdallah</i>	
<b>VOLTAGE AND FREQUENCY CONTROL OF A SELF-EXCITED INDUCTION GENERATOR USING BIDIRECTIONAL STATCOM DEVOTED TO RURAL ELECTRIFICATION .....</b>	<b>224</b>
<i>D. Chermiiti ; A. Khedher</i>	
<b>AN OPEN CIRCUIT SWITCHING FAULT DIAGNOSIS APPROACH FOR BACK-TO-BACK CONVERTER USING WAVELET ANALYSIS .....</b>	<b>230</b>
<i>Adla Ismail ; Lotfi Saidi ; Mounir Sayadi</i>	
<b>FEASIBILITY OF REPLACING TRADITIONAL STREETS LIGHTING IN AL-BAYDA CITY WITH SOLAR CELLS TECHNOLOGY .....</b>	<b>236</b>
<i>Aiman Nough ; Aboubakr Saed ; Ashraf Elmurtaga</i>	

<b>NUMERICAL STUDY ON THE CATHODE CHANNEL WIDTH RATIO FOR IMPROVING PERFORMANCE OF AIR COOLED PEMFC</b> .....	242
<i>Gundu Mohamed Hassan ; Jaeseung Lee ; C. Muhammad Faizan ; Hyunchul Ju</i>	
<b>NUMERICAL STUDY ON DIAGNOSIS OF FAILURE MODES IN PEMFC SYSTEM</b> .....	247
<i>C. Muhammad Faizan ; Lee Jaeseung ; Gundu Mohamed Hassan ; Hyunchul Ju</i>	
<b>EFFECT OF TAPER DISTRIBUTION ON THE TORQUE AND THRUST GENERATED BY A WIND TURBINE ROTOR BLADE</b> .....	253
<i>Mustafa Kaya ; Munir Elfarra</i>	
<b>A FAST MPPT ALGORITHM FOR SMART GRID-PV CONNECTED SYSTEM BASED ON MULTIPLE SPARSE-AWARE TIME-VARYING STEPSIZE ADAPTATION TECHNIQUE</b> .....	259
<i>Haider Abdallatif ; Ikhlas Abdel-Qader ; Ahmad Harb</i>	
<b>A STUDY ON THE EFFICIENCY OF INTEGRATING PHASE CHANGE MATERIALS IN THE ROOF STRUCTURE OF RESIDENTIAL BUILDINGS IN TUNISIA</b> .....	265
<i>Khawla Saafi ; Naouel Daouas</i>	
<b>DESIGN OF AN ELECTRICITY CONSUMPTION MEASUREMENT SYSTEM FOR NON INTRUSIVE LOAD MONITORING</b> .....	271
<i>Sarra Houidi ; François Auger ; Philippe Frétaud ; Dominique Fourer ; Laurence Miègeville ; Houda Ben Attia Sethom</i>	
<b>VOLTAGE PROFILE ENHANCEMENT USING MULTI-OBJECTIVE SINE COSINE ALGORITHM FOR OPTIMAL INSTALLATION OF DSTACOMS INTO DISTRIBUTION SYSTEMS</b> .....	277
<i>Ali Selim ; Salah Kamel ; Francisco Jurado</i>	
<b>SOC ESTIMATION OF LI-ION BATTERY PACK FOR LIGHT ELECTRIC VEHICLES USING ENHANCED COULOMB COUNTING ALGORITHM</b> .....	283
<i>Meriem Ben Lazreg ; Ines Baccouche ; Sabeur Jemmali ; Bilal Manai ; Mahmoud Hamouda</i>	
<b>THE INFLUENCE OF THE COATING THICKNESS ON TRANSMISSION IN ELECTRONIC DEVICES</b> .....	289
<i>Leila Troudi ; Khaled Jelassi ; Mounir Ben Fredj</i>	
<b>BIOCHAR PRODUCTION FROM GRAPE MARC, KENAF STEMS AND FLAX SHIVES: EFFECT OF TEMPERATURE ON TEXTURAL AND PHYSICO-CHEMICAL PROPERTIES</b> .....	294
<i>A. I. Ferjani ; Mejdi Jeguirim ; Lionel Limousy ; Salah Jellali ; Hanène Akrouf</i>	
<b>IMPACT OF RENEWABLE ENERGY ON THE ECONOMIC DISPATCH IN JORDAN</b> .....	298
<i>Ahmad Harb ; Ina'm Alramahi</i>	
<b>IMPACT OF IMBALANCED WIND TURBINE GENERATOR COOLING ON RELIABILITY</b> .....	304
<i>Gopal Singh ; Marco Matuonto ; Kalpathy Sundaram</i>	
<b>THERMODYNAMIC ANALYSIS OF ORC SOLAR POWER PLANT OPERATING IN SOUTHERN TUNISIA</b> .....	310
<i>Rafika Maali ; Tahar Khir ; Vincent Lemort ; Ammar Ben Brahim</i>	
<b>PARALLEL WORKING OF DFIG BASED WIND SYSTEMS UNDER UNBALANCED GRID CONDITIONS</b> .....	314
<i>Meriem Ghodbane-Cherif ; Sondes Skander-Mustapha ; Ilhem Slama-Belkhodja</i>	
<b>COMBUSTION BEHAVIOUR OF SEVERAL MEDITERRANEAN BIOMASS SOURCES AND THEIR BLENDS BIOMASS/CHAR</b> .....	320
<i>Nourelhouda Boukaous ; Lokmane Abdelouahed ; Mustapha Chikhi ; Abdeslam-Hassen Meniai ; Bechara Taouk</i>	
<b>SMART TECHNOLOGY FOR SAFETY SOLAR PANEL</b> .....	326
<i>Habib Nasser ; Aziz Naamane ; Saadi Brahm</i>	
<b>UTILIZING DISTRIBUTED GENERATORS FOR ENHANCING POWER QUALITY OF DISTRIBUTION NETWORKS</b> .....	331
<i>Ayman M. Fouad ; R. M. Sharkawy ; M. H. Ahmed ; M. M. A. Salama</i>	
<b>SENSORLESS ACTIVE DAMPING OF LCL FILTER BASED ON MRAS ESTIMATOR FOR SINGLE-PHASE GRID-CONNECTED INVERTER</b> .....	336
<i>Meriem Dardouri ; Sejir Khojet El Khil ; Khaled Jelassi</i>	
<b>DETERMINATION OF KINETIC AND STOICHIOMETRIC PARAMETERS IN ANOXIC MOVING BED BIOFILM REACTOR BY PULSE RESPIROMETRY</b> .....	341
<i>Meriem Bouteraa ; Rania Zamouche-Zerdazi ; Mossaab Bencheikh Lehocine ; Abdeslam Hassen Meniai</i>	
<b>ENHANCED REAL TIME IMPEDANCE EMULATION FOR MICROGRID EQUIPMENTS TESTING AND APPLICATIONS</b> .....	347
<i>Marwa Ben Saïd-Romdhane ; Sondes Skander-Mustapha ; Ilhem Slama-Belkhodja</i>	
<b>DEPENDENCE OF NOVEL TRIPLE JUNCTION SOLAR CELL PARAMETERS ON CELL'S TEMPERATURE</b> .....	353
<i>Marwa Hamza ; Olfa Bel Hadj Brahim Kechiche ; Habib Sammouda</i>	

<b>ON- SITE 0.5-1KW HUMMER WIND TURBINE PERFORMANCE TEST .....</b>	<b>359</b>
<i>Yousef Sassi ; Zakariya Rajab ; Ahmed Taher ; Khalid Muftah ; Mohammed Ehbara ; Faisal Mohamed</i>	
<b>PERFORMANCE LIMITATIONS STUDY OF SILICON PV MODULE FOR LOW CONCENTRATION SYSTEM.....</b>	<b>365</b>
<i>Olfa Bel Hadj Brahim Kechiche ; Marwa Hamza ; Habib Sammouda</i>	
<b>EXERGETIC AND ECONOMIC ANALYSIS FOR SINGLE PASS RO WITH PX POWERED BY ORC USING BRACKISH WATER.....</b>	<b>370</b>
<i>Nuri Mohamed Eshoul</i>	
<b>OLIVE OIL BY-PRODUCTS : FROM HARMFUL WASTE TO INTERESTING CARBONACEOUS MATERIALS: HYDROTHERMAL CONVERSION OF OLIVE OIL BY-PRODUCTS INTO CARBON RICH CHARS.....</b>	<b>376</b>
<i>Ahmed Amine Azzaz ; Mejdi Jeguirim ; Camélia Ghimbeu ; Simona Bennici ; Lionel Limousy ; Mansour Issaoui ; Salah Jellali</i>	
<b>ON THE ENERGY MANAGEMENT FOR A STAND-ALONE HYBRID SYSTEM IN ISOLATED AREA.....</b>	<b>381</b>
<i>Daniel López ; Imene Yahyaoui ; Fernando Tadeo ; Santiago Arnaltes</i>	
<b>FABRICATION AND ELECTROCHEMICAL CHARACTERIZATION OF CARBON BASED SUPERCAPACITOR ELECTRODES .....</b>	<b>386</b>
<i>Mohamad K. Khawaja ; Mohammad F. Khanfar ; Talin Oghlenian ; Waed Alnahar</i>	
<b>EMULATING AND AMPLIFYING AN I-V PANEL BASED ON AN ELECTRICAL MODEL OF A PV CELL.....</b>	<b>390</b>
<i>Mohamed Boussaada ; Riadh Abdelati ; Hedi Yahia</i>	
<b>MODELING AND SIMULATION OF PEM FUEL CELL/SUPERCAPACITOR HYBRID POWER SOURCES FOR AN ELECTRIC VEHICLE .....</b>	<b>396</b>
<i>Wahib Andari ; Mohamed Salmen Ben Yahia ; Hatem Allagui ; Abdelkader Mami</i>	
<b>ONLINE CONDITION MONITORING OF SUB-MODULE CAPACITORS IN MMC ENABLED BY REDUCED SWITCHING FREQUENCY SORTING SCHEME .....</b>	<b>402</b>
<i>Chenming Zhang ; Weichi Zhang ; Salaheddine Ethni ; Mohamed Dahidah ; Volker Pickert ; Hamza Khalfalla</i>	
<b>A MODELING APPROACH TO AMELIORATE THE ENERGETIC EFFICIENCY OF REVERSES OSMOSIS MEMBRANE FOR SALT WATER DESALINATION .....</b>	<b>408</b>
<i>Missaoui Samia ; Sellami Mohamed Habib ; Othmen Tahar</i>	
<b>EFFICIENCY BOOSTING FOR PROTON EXCHANGE MEMBRANE FUEL CELL POWER SYSTEM USING NEW MPPT METHOD.....</b>	<b>412</b>
<i>Mohamed Derbeli ; Oscar Barambones ; Maïssa Farhat ; Lassaad Sbïta</i>	
<b>SUPERVISION OF ENERGY STORAGE SYSTEM OF HRES GRID CONNECTED .....</b>	<b>416</b>
<i>Siheem Saidani ; Nabih Brahmi ; Maher Chaabene</i>	
<b>TUNISIAN AGRO-FOOD WASTES RECOVERY BY PYROLYSIS: THERMOGRAVIMETRIC ANALYSIS AND KINETIC STUDY.....</b>	<b>422</b>
<i>Besma Khiari ; M. Jeguirim</i>	
<b>DESIGN OF COMBINED HEAT AND POWER FOR WASTE WATER TREATMENT PLANT .....</b>	<b>427</b>
<i>Jabulile Kgomo ; Aubrey Ngobeni ; M Lencwe ; S. Daniel Chowdhury</i>	
<b>DESIGN OF A SOLAR PHOTOVOLTAIC SYSTEM TO POWER THE COMMUNITY OF RIVERTON IN DROOGFONTEIN .....</b>	<b>432</b>
<i>C. Molotsi ; A. T. Puati Zau ; S. P. Daniel Chowdhury ; A. Ngobeni</i>	
<b>GREEN ENERGY FOR RAILWAY TRAIN MOUNTED WIND GENERATOR .....</b>	<b>439</b>
<i>Jeremiah Zulu ; Mpho J. Lencwe ; S. Daniel Chowdhury</i>	
<b>SMART METERS FOR THE EVALUATION OF SELF-CONSUMPTION IN ZERO ENERGY BUILDINGS.....</b>	<b>445</b>
<i>G. Jiménez-Castillo ; G. M. Tina ; F. J. Muñoz-Rodríguez ; C. Rus-Casas</i>	
<b>CASE STUDY OF A SOLAR COOLING SYSTEM USING HYBRID PV AND CST TECHNOLOGIES.....</b>	<b>451</b>
<i>Abdessalem Ben Haj Ali ; Moncef Balghouthi ; Amenallah Guizani</i>	
<b>RESONANCE FREQUENCY DETECTION TECHNIQUE IN GRIDCONNECTED INVERTER SYSTEMS BASED ON DOUBLE-ORDER DIGITALIZED FILTER.....</b>	<b>457</b>
<i>Hamza Khalfalla ; Salaheddine Ethni ; Nasiru B. Kadandani ; Volker Pickert</i>	
<b>PYROLYSERS CONFIGURATIONS EFFECTS ON SCRAP WASTE TIRES PYROLYSIS PRODUCTS .....</b>	<b>463</b>
<i>Rejeb Hiba ; Emna Berrich ; Chahbani Mohamed Hachemi</i>	
<b>THE SIZING OF THE ISOLATED PHOTOVOLTAIC SYSTEM (DOMESTIC SELF-CONSUMPTION) AND ECONOMIC COMPARISON BETWEEN THE COST OF THIS ENERGY (PRICE OF KWH) AND DIFFERENT SECTOR) .....</b>	<b>469</b>
<i>Bentarfa Djehad ; Channouf Nasreddine ; Bensari Halima ; Sekirifa Mohamed Lamine</i>	

<b>GREEN CHEMISTRY METRICS APPLICATION TO BIODIESEL PRODUCTION FROM WASTE VEGETABLE OIL</b> .....	473
<i>H. Kerras ; R. Merouani ; C. Nekkab ; N. Outili ; A. H. Meniai</i>	
<b>A PV ARRAY RECONFIGURATION ALGORITHM FOR MINIMISING PARTIAL SHADING EFFECTS</b> .....	478
<i>Mohamed Etarhouni ; Benjamin Chong ; Li Zhang</i>	
<b>ESTIMATING THE AMOUNT OF METHANE GAS GENERATED FROM THE FEEDSTOCK: A CASE STUDY OF EL-BEIDA CITY, LIBYA</b> .....	484
<i>Ahmad Belkhair ; Tarek Hamad</i>	
<b>STUDY ABOUT HYBRID CSP — PV PLANTS FOR THE MENA REGION</b> .....	489
<i>Daniel Benitez ; Sofiane Bouaichaoui ; Andreas Kazantzidis ; Ahmed Al-Salaymeh ; Abdessalem Ben Haj Ali ; Moncef Balghouthi ; Amenallah Guizani</i>	
<b>EXPERIMENTAL STUDY OF SLUDGE DRYING BED UNDER A MEDITERRANEAN CLIMATE IN TUNISIA</b> .....	495
<i>Azza Masmoudi ; Ahlem Ben Sik Ali ; Hatem Mhiri ; Hatem Dhaouadi</i>	
<b>MODIFIED EQUATION OF STATE AND SUBLIMATION PRESSURE OF ANTIBIOTIC PENICILLIN G</b> .....	501
<i>Nasri Loubna</i>	
<b>DOUBLE DIFFUSIVE FREE CONVECTION IN A 3D CAVITY FILLED WITH MICROPOLAR CU-AL<sub>2</sub>O<sub>3</sub>/WATER HYBRID NANOFLUID</b> .....	505
<i>Manaa Nessrin ; Borjini M. Naceur ; Abidi Awatef</i>	
<b>A FLEXIBLE SOLVENT-FREE POLYMER ELECTROLYTE BASED ON METHACRYLIC MONOMER FABRICATED BY UV-CURING FOR LITHIUM-ION BATTERIES</b> .....	511
<i>Lei Jin ; Taewook Ryu ; Sujin Yoon ; Inhwan Choi ; Seungchan Lee ; Jaewoong Kim ; Whangi Kim</i>	
<b>COMPARATIVE ANALYSIS OF PI AND PR BASED CURRENT CONTROLLERS FOR GRID CONNECTED PHOTOVOLTAIC MICRO-INVERTERS</b> .....	516
<i>Mounir Hlali ; Imen Bahri ; Hamed Belloumi ; Ferid Kourda</i>	
<b>SENSITIVITY STUDY OF THERMAL PERFORMANCE CHARACTERISTICS FOR INDIRECT STEAM GENERATION IN PARABOLIC DISH COLLECTOR</b> .....	522
<i>Karima Ghazouani ; Safa Skouri ; Salwa Bouadila ; Amenallah Guizani</i>	
<b>EXPERIMENTAL STUDY OF BIOMETHANE PRODUCTION FROM ORGANIC DISCHARGES</b> .....	528
<i>Mouftahi Mawaheb ; Hidouri Nejib ; Tlili Nawel ; Ben Brahim Ammar</i>	
<b>SIZING AND IMPROVING PERFORMANCES OF A PHOTOVOLTAIC WATER PUMPING SYSTEM FOR IRRIGATION IN JERID TUNISIA</b> .....	532
<i>Raja Yahmadi ; Kais Brik ; Faouzi Ben Ammar</i>	
<b>OPTIMAL DISTRIBUTION SYSTEM RECONFIGURATION FOR LOSS MINIMIZATION USING BPSO ALGORITHM</b> .....	538
<i>Sirine Essallah ; Adel Khedher</i>	
<b>GENERIC ANALYTICAL MODELS FOR ORGANIC AND PEROVSKITE SOLAR CELLS</b> .....	544
<i>Abdelhalim Zekry ; Imene Yahyaoui ; Fernando Tadeo</i>	
<b>FLUX DENSITY MODELLING IN A SOLAR TOWER POWER PLANT WITH REDUCED SHADING EFFECT</b> .....	550
<i>Fathia Eddhibi ; Mahmoud Ben Amara ; Moncef Balghouthi ; Amenallah Guizani</i>	
<b>FUZZY LOGIC COMPENSATOR OF HARMONIC CURRENTS ON SHUNT FILTER FOR PHOTOVOLTAIC GENERATOR</b> .....	557
<i>Madame Banawaz Marwa ; Monsieur Mohamed Nejib Mansouri</i>	
<b>ENERGY SOURCE PLANNING FOR AN ENTERPRISE RENEWABLE ENERGIES</b> .....	563
<i>Arnaldo De Zorzi ; Miguel Edgar Morales Udaeta ; André Luiz Veiga Gimenes ; Renato Povia Silva</i>	
<b>EFFECTS OF SWIRL NUMBER ON THE PERFORMANCE OF COMBUSTION AND PRODUCT MIXING OF COAL PULVERIZED BURNER</b> .....	569
<i>Lakhal Fatma Ezzahra ; Bouabidi Abdallah ; Aguerbi Senda ; Mouldi Chrigui</i>	
<b>THEORETICAL ENERGY PRODUCTION PERFORMANCE DETERMINATION IN WIND AND PHOTOVOLTAIC POWER SYSTEMS</b> .....	575
<i>Miguel Edgar Morales Udaeta ; Raul Vaz De Paula ; Andre Luiz Veiga Gimenes ; Luiz Claudio Ribeiro Galvão</i>	
<b>POWER SYSTEM VOLTAGE STABILITY BASED ON OPTIMAL SIZE AND LOCATION OF SHUNT CAPACITOR USING ANALYTICAL TECHNIQUE</b> .....	581
<i>Salah Kamel ; Marwa Mohamed ; Ali Selim ; Loai S. Nasrat ; Francisco Jurado</i>	
<b>POWER LOSSES AND ENERGY COST MINIMIZATION USING SHUNT CAPACITORS INSTALLATION IN DISTRIBUTION SYSTEMS</b> .....	586
<i>Ali Selim ; Salah Kamel ; Francisco Jurado</i>	

<b>DEVELOPMENT OF PROBABILISTIC POWER FLOW ALGORITHM FOR RADIAL DISTRIBUTION SYSTEMS WITH CAPACITORS USING ANALYTICAL APPROACH</b> .....	592
<i>Salah Kamel ; Walaa Hamdy ; Samah Abd-Elgwad ; Ali Selim ; Francisco Jurado</i>	
<b>SUPERCRITICAL WATER GASIFICATION OF GLYCEROL FOR HYDROGEN PRODUCTION USING RESPONSE SURFACE METHODOLOGY</b> .....	598
<i>Ibtissem Houcinat ; Nawel Outili ; Abdesslam Hassen Meniai ; Elsa Weiss-Hortala</i>	
<b>GASIFICATION OF SEWAGE SLUDGE ENRICHED WITH PLANT BIOMASS - MODELING AND TESTS</b> .....	604
<i>S. Szwaja ; A. Poskart ; M. Szwaja ; M. Zajemska</i>	
<b>BASICS ON ENERGY ECONOMICS OF RENEWABLE POWER GENERATION PROJECTS: A FOCUS ON UTILITY-SCALE PV PLANTS INCLUSION ON NATIONAL GRID</b> .....	610
<i>Mauricio Torres Consulo ; André Luiz Veiga Gimenes ; Stefania Gomes Relva ; Miguel Edgar Morales Udaeta</i>	
<b>ADDRESSING REDUCED INGRESS PROTECTION CLASS &amp; PROPER FILTER SELECTION FOR OPEN VENTILATED (IC3A1) WIND TURBINE GENERATOR</b> .....	616
<i>Gopal Singh ; Kalpathy Sundaram ; Ahmad Saleh</i>	
<b>MODELLING, DESIGN AND CONTROL OF CASCADED H-BRIDGE SINGLE PHASE RECTIFIER</b> .....	621
<i>Nasiru B. Kadandani ; Salaheddine Ethni ; Mohamed Dahidah ; Hamza Khalfalla</i>	
<b>COORDINATED TUNING OF SVC AND PSS IN POWER SYSTEM USING TEACHING LEARNING BASED ALGORITHM</b> .....	627
<i>Yosra Welhazi ; Tawfik Guesmi ; Hsan Hadj Abdallah</i>	
<b>RAMP-RATE RISK CHARACTERIZATION AND COMPARISON USING SURVIVAL THEORY</b> .....	633
<i>Matthew Groch ; Hendrik J. Vermeulen</i>	
<b>ADSORPTION OF HYDROGEN ON ACTIVATED CARBONS PREPARED BY THERMAL ACTIVATION: HYDROGEN STORAGE</b> .....	639
<i>M. Belhachemi ; M. Monteiro De Castro ; M. Casco ; A. Sepúlveda-Escribano ; F. Rodríguez-Reinoso</i>	
<b>IMPACT OF DISTRIBUTED GENERATION PENETRATION ON RADIAL NETWORKS WITH SHUNT COMPENSATION</b> .....	644
<i>I. Molver ; S. Chowdhury</i>	
<b>COMPARISON OF PERTURB &amp; OBSERVE AND HILL CLIMBING MPPT SCHEMES FOR PV PLANT UNDER CLOUD COVER AND VARYING LOAD</b> .....	649
<i>P. Motsoeneng ; J. Bamukunde ; S. Chowdhury</i>	
<b>CLUSTERING OF WIND RESOURCE WEIBULL CHARACTERISTICS ON THE SOUTH AFRICAN RENEWABLE ENERGY DEVELOPMENT ZONES</b> .....	655
<i>Chantelle Y. Janse Van Vuuren ; Hendrik J. Vermeulen ; Johannes C. Bekker</i>	
<b>REDUCED ORDER MODEL AND CONTROL OF NON-ISOLATED HIGH GAIN BOOST CONVERTER</b> .....	662
<i>M. Muhammad ; M. Armstrong ; M. A. Elgendy ; S. Lambert ; V. Pickert</i>	
<b>TECHNICAL ASSESSMENT OF PLUG-IN HYBRID ELECTRIC VEHICLE CHARGING SCHEDULING FOR PEAK REDUCTION</b> .....	668
<i>Mohammad Mominur Rahman ; Essam A. Al-Ammar ; Himadry Shekhar Das ; Wonsuk Ko</i>	
<b>PHOTOVOLTAIC SIMULATOR INTERFACE BASED ON TWO-DIODE EQUIVALENT CIRCUIT MODEL</b> .....	673
<i>Intissar Moussa ; Adel Khedher</i>	
<b>HYBRID RENEWABLE-BASED RELIABLE AND COST-EFFECTIVE RURAL ELECTRIFICATION IN SOUTHERN AFRICA</b> .....	679
<i>A. Ramseebaluck ; S. Chowdhury</i>	
<b>Author Index</b>	