

Contents

Part I Biomass

1 Development Model of Renewable Energy Policy for Sustainable Bio-Pellet Industry in Indonesia Using Interpretive Structural Method	3
Erwin Susanto Sadirsan, Hermanto Siregar, Eriyatno and Evita H. Legowo	
2 Features of Carbon Stock in the Biomass of Industrial Hemp and Stinging Nettle	17
B. Butkutė, I. Liaudanskienė, Z. Jankauskienė, E. Gruzdevienė, J. Cesevičienė and K. Amalevičiūtė	
3 Obtaining Long-Chain Esters with Lubricant Properties from Sesame Biomass (<i>Sesamum indicum</i>)	31
Tathilene Bezerra Mota Gomes Arruda, Francisco Eduardo Arruda Rodrigues, Manoel Barbosa Dantas, Solange Assunção Quintella, David Thomas Duarte Arruda, Célio Loureiro Cavalcante Jr and Nágila Maria Pontes Silva Ricardo	
4 Biodiesel from Jatropha Oil	39
Ebtisam K. Heikal, Salah A. Khalil and Ismaeil K. Abdou	
5 Solid Acid Catalyst Derived from Coffee Residue for Biodiesel Production	47
Kanokwan Ngaosuwan	
6 Evaluation of Energy Demand and Air Emissions by Using the Long-range Energy Alternatives Planning (LEAP) Model in Transport Sector of Punjab, Pakistan	57
Sheikh Saeed Ahmad and Syeda Qamar Batool	

7 Issues and Challenges of Implementing Waste-to-Energy Practices in India.....	65
J. D. Nixon, D. Wright, P. K. Dey, J. A. Scott, S. Sagi and S. K. Ghosh	
8 The Variation of Ash and Inorganic Elements Concentrations in the Biomass of Lithuania-Grown Switchgrass (<i>Panicum Virgatum</i> L.).....	75
B. Butkutė, J. Cesevičienė, N. Lemežienė, E. Norkevičienė, G. Dabkevičienė and Ž. Liatukas	
9 Microwave Pyrolysis Process Potential of Waste Jatropha Curcas Seed Cake.....	91
Ricardo A. Narváez C., Valeria Ramírez, Diego Chulde, Sebastián Espinoza and Jesús López-Villada	
Part II Fuel Cells	
10 Fuel Processing of Low-Sulfur Diesel for Fuel Cell Systems	103
Joachim Pasel, Remzi Can Samsun, Ralf Peters and Detlef Stolten	
11 Basic Study on the Application of the Fuel Cell System Operated by Kerosene to Vessel.....	113
Kazuyoshi Sumi	
12 System Modelling for Hybrid Solar Hydrogen Generation and Solar Heating Configurations for Domestic Application	123
Krisztian Ronaszegi, Dan J L Brett and Eric S Fraga	
13 An Integrated System for Energy-efficient Exhaust Aftertreatment for Heavy-duty Vehicles	133
Jazaer Dawody, Lennart Andersson, Lars J. Pettersson, Moa Ziethén Granlund, Hanna Härelind, Fredrik Gunnarsson, Anders Palmqvist, Rickard Heijl, Ronnie Andersson, Olle Högbloom, Lennart Holmgren, Per-Olof Larsson and Fredrik Andreasson	
14 Cost-effectiveness and Potential of Greenhouse Gas Mitigation through the Support of Renewable Transport Fuels in Iceland	145
Ehsan Shafiei, Brynhildur Davidsdottir, Jonathan Leaver, Hlynur Stefánsson and Eyjolfur Ingi Asgeirsson	
15 Parametric Study of Polymer Electrolyte Membrane Fuel Cell Performance Using CFD Modelling.....	159
Angus Hood, Shaun Slater, Matthew Bouchet, Sheikh Zahidul Islam and Mamdud Hossain	

16 Proton Modified Pt Zeolite Fuel Cell Electrocatalysts	173
Jun Yao, Yufeng Yao and Hossein Mirzaii	
17 Improved Dynamic Response and Range in Microbial Fuel Cell-Based Volatile Fatty Acid Sensor by Using Poised Potential	183
Amandeep Kaur, Richard M. Dinsdale, Alan J. Guwy and Giuliano C. Premier	
18 The Application of Solar-Powered Polymer Electrolyte Membrane (PEM) Electrolysers for the Sustainable Production of Hydrogen Gas as Fuel for Domestic Cooking	193
Evangelia Topriska, Maria Kolokotroni, Zahir Dehouche, Ruth Potopsingh, Earle Wilson	
19 Surface Modification and Optimization of Semiconductor ns-TiO₂-WO₃ Admixed Photoelectrode in Regard to Solar Hydrogen Production	205
Mridula Tripathi and Priyanka Chawla	
20 Hydrogen for Mobility: An Assessment from Economic, Energetic, and Ecological Point of View	215
Amela Ajanovic and Reinhard Haas	
Part III Geothermal Energy	
21 Hydrogeothermal Potential of the Belgrade City Area, the Capital of Serbia First Assessment	227
Dejan Milenic, Ana Vranjes and Nenad Doroslovac	
22 Automatic Optimization of Multiple Borehole Heat Exchanger Fields	235
Peter Bayer, Markus Beck and Michael de Paly	
23 Thermo-economic Study of Hybrid Thermal Solar and Geothermal Heat Pumps System in Algeria	247
Mounir Aksas, Fouad Khaldi and Rima Zouagri	
Part IV Hydropower and Ocean Energy	
24 Study on Tandem Configuration of a Flapping Tidal Stream Generator	261
Jihoon Kim, Tuyen Quang Le, Jin Hwan Ko, Jin-Soon Park and Kwang-Soo Lee	

25 An Economic Approach for the Design of Small Hydropower Converter	271
Jana Hadler and Klaus Broekel	
26 Identifying Promising Wave Energy Converter Technologies	279
Matt Folley and Trevor Whittaker	
27 Optimal Operation Control of Hydrokinetic-based Hybrid Systems	291
Kanzumba Kusakana, Herman Jacobus Vermaak and Bubele Papy Numbi	
28 Experimental and Numerical Investigation of Blade Angle Variation on a Counter-Rotating Tidal Current Turbine	305
Lee Nak-Joong, Kim In-Chul, Hyun Beom-Soo and Lee Young-Ho	
29 Challenge to Use Small Hydropower by Contra-rotating Small Hydro Turbine	317
Toru Shigemitsu, Junichiro Fukutomi and Chihiro Tanaka	
30 Site Implementation of a Low-Head Pico-Hydro Turgo Turbine	329
Samuel J. Williamson, Julian D. Booker and Bernard H. Stark	
31 Design of a Linear Electrical Machine for a Wave Generation System in the Maltese Waters	339
Xuerab Annalise, Spiteri Staines Cyril, Sant Tonio and Mulè Stagno Luciano	
32 Modelling Tidal Stream Turbines	351
Sarah Tatum, Carwyn Frost, Daphne O'Doherty, Allan Mason-Jones and Tim O'Doherty	
33 Experimental Validation of Gap Leakage Flow Models in Archimedes Screw Generators	365
Andrew Kozyn and William D. Lubitz	
Part V Low-Energy Architecture	
34 Double- or Single-Skin Façades for Low-Carbon Office Refurbishments in the UK: A Comparative Case Study	379
Francesco Pomponi and Poorang A.E. Piroozfar	
35 Architectural Factors Influenced on Physical Environment in Atrium	391
Wei Zhao, Jian Kang and Hong Jin	

36 Numerical Simulation Analysis on Wind Environment of Traditional Village Courtyard in Severe Cold Regions	405
Xinyu Zhang, Hong Jin and Xu Dong	
37 Energy Saving and Emission Analysis via Lighting Retrofitting in a Large-Scale Hospital: Case Study in Malaysia	415
S Moghimi, F Azizpour, C. H Lim, E Salleh, S Mat and K Sopian	
38 The Effect of Wind Velocity and Night Natural Ventilation on the Inside Air Temperature in Passive Cooling Ventilation in Arid Zones	423
H. Bencheikh	
39 The Building Energy Consumption and Outdoor Design Conditions of Severe Cold Regions Based on Climate Change	433
Teng Shao and Hong Jin	
40 Low-Energy Architecture: Cuban Contradictions	443
Dania González Couret	
41 Towards Nearly Zero-Energy Buildings in 2020 in the Netherlands	455
Kristian Gvozdenovic, Wim Maassen and Wim Zeiler	
42 How to Reach for the Necessary Synergy Between Architecture and Engineering	465
Wim Zeiler	
43 Study of the Aeraulic Flows in the Building of the Valve Halls Mandarins, France	475
N. Laaroussi, L-V. Bénet, F. Lacroux and M. Garoum	
44 Experimental and Theoretical Study for the Performance of New Local Thermal Insulation in Iraqi Building	487
Ghanim Kadhim Abdulsada and Tawfeeq Wasmi M. Salih	
45 Simulation-Based Optimization for Energy and Buildings	503
Ala Hasan, Matti Palonen and Mohamed Hamdy	
46 Low-Energy Earth–Air Heat Exchanger Cooling System for Buildings in Hot and Humid Malaysia	515
Aliyah N. Z Sanusi, Li Shao and Nila I Keumala	
47 Analysis of Passive Solar House to Improve the Indoor Thermal Environment in Winter in Lhasa, China	529
Ming Zhang, Wei Yu and Baizhan Li	

48 Building Energy Index and Students' Perceived Performance in Public University Buildings	541
S. N. N. Syed Yahya, A. R. M. Ariffin and Muhammad Azzam Ismail	
49 Energy-Efficient Refurbishment of Existing Buildings: A Multiple Case Study of Terraced Family Housing	551
D.K. Serghides, N. Saboohi, T. Koutra, M.C. Katafygiotou and M. Markides	
50 Low-Energy Architecture: From Theory to Design	561
Despina K. Serghides	
51 Development of a Luminous Efficacy Model Using Ground and Satellite-Based Data from the Tropics	569
Rungrat Wattan and Serm Janjai	
52 Investigation on the Existing Circumstances and Contributing Factors of Thermal Environment of Rural Housings in Severe Cold Zones of China in Winter	577
Hong Jin and Kai Chen	
53 Simulation Analysis and Planning Strategies for the Wind Environment of Residential Quarter in Harbin	585
Ming Li, Hong Jin and Teng Shao	
54 Energy Efficiency Building Codes and Green Pyramid Rating System	597
George Bassili Hanna	
55 Simulation Comparison Between Natural and Hybrid Ventilation by Fans at Nighttime for Severe Hot Climate (Aswan, Egypt)	609
A. Rizk, A. El-Deberky and Nabil M Guirguis	
56 Green Building and Energy Saving	621
Mahmoud A Hassan and Nabil M Guirguis	
57 Energy Savings and Environmental Benefits from Solar Window Film for Buildings in Kurdistan of Iraq	627
Kamil M. Yousif	
58 Research on Daylighting Introduction of Commercial Buildings in Different Climate Zone of China	637
Hong Jin and Xin-xin Li	

59 Reducing Canadian Greenhouse Energy Costs Using Highly Insulating Glazing	649
William David Lubitz	
60 Self-Sufficient Prefabricated Modular Housing: Passive Systems Integrated	659
Alberto García Marín, Jorge Barrios Corpa, Javier Terrados Cepeda, Juan de la Casa Higuera and Jorge Aguilera Tejero	
61 The Road to Integrated Design Process of Net-Zero Energy Solar House	675
Mona Azarbayjani, Ben Futrell and Valentina Cecchi	
62 Describing Native Architectural Features of Kandovan, a Sustainable Village with Rock Architecture	687
Navid Nahi and Maryam Singery	
63 Investigating the Effect of Climatic Factors on the Spatial Structure of Old Texture of Yazd City: A Specimen of a Sustainable Urban Texture	701
Navid Nahi and Maryam Singery	
64 Enable Environmental Policies for Eco-Industrial Growth: A Voluntary Government Tool for Local Productive Areas in Tuscany (Italy)	711
Paola Gallo	
65 Smart Envelope for Nearly Zero Energy Schools. The Case Study of Vallisneri Secondary School in Lucca	723
Rosa Romano	
66 A Comparison of Computational Simulation and Physical Measurement of Solar Radiation and Photovoltaic Outputs for Residential Dwellings	733
Stephen Pretlove and Patrick R. Osborne	
67 Courtyards: Optimum Use as Means of Providing Daylight into Adjacent Zones	751
Maitha M. Bin Dalmouk and Khaled A. Al-Sallal	
68 Earth Construction: The Mechanical Properties of Adobe with the Addition of Laponite	761
Francesca Scalisi and Cesare Sposito	

69 The Development of Renewable Energy Applications in Buildings in Greece During The Last Decade	771
Nikos Papamanolis	
70 Preliminary Results Concerning the Thermal Comfort in a Romanian Passive House.....	779
Ruxandra Crutescu, Ioana Udrea, Ilinca Nastase, Cristiana Croitoru and Viorel Badescu	
71 Towards a Comprehensive Approach to Sustainable Urban Planning: Integrated Estimation of Housing Electricity Consumption and Photovoltaic Generation Potential Using the web-based framework iGUESS®.....	791
Alessio Mastrucci, Christian Braun, Olivier Baume, Francesca Stazi and Ulrich Leopold	
72 Energy-Efficient Lighting by LED	801
Helmut F. O. Mueller and Francesco Sasso	
Part VI Wind Energy	
73 Power System Performance of Offshore Wind in the UK in 2030.....	811
P. Higgins and A. M. Foley	
74 Testing Operation and Control Functions of Wind Power Plant Control System by Hardware in-the-loop Simulation	827
Jong Yul Kim, Gyeong Hun Kim, Jin-Hong Jeon, Seul Ki Kim and Eung Sang Kim	
75 Blade Element Momentum Theory and CFD Modeling as a Tool for Optimizing Wind Turbine Blade Design	837
K. Dogan and G. Martinopoulos	
76 Integration of Wind Energy in Power System—Modelling of a Market Oriented Energy Concept	845
Yassin Bouyraaman, Jörg Bendfeld, Philipp Breymann and Stefan Krauter	
77 Design and Experimental Validation of Thick Airfoils for Large Wind Turbines.....	855
Iva Hrgovan, Wen Zhong Shen, Wei Jun Zhu, Jesper Madsen and Rolf Hansen	
78 A Novel Topology for Enhancing the Low-Voltage Ride-Through Capability for Grid Connected Wind Turbine Generators.....	865
R. A. Ibrahim, M. S. Hamad, Y. G. Dessouky and B. W. Williams	

79 Conceptual Design of Airborne Wind Turbines	883
Hossein Mirzaii and Liam Griggs	
80 Wind Shear Assessment Using Wind LiDAR Profiler and Sonic 3D Anemometer for Wind Energy Applications— Preliminary Results	893
Yoshiaki Sakagami, Pedro A. A. Santos, Reinaldo Haas, Júlio C. Passos and Frederico F. Taves	
81 Atmospheric Stability Effects on Small Wind Turbine Power Collection in a Complex Terrain	903
Pedro A. A. Santos, Yoshiaki Sakagami, Reinaldo Haas, Júlio C. Passos and Frederico F. Taves	
82 Robust Design of Savonius Wind Turbine	913
Vishaal Dhamotharan, Ranjana Meena, Piyush Jadhav, Palaniappan Ramu and K. Arul Prakash	
83 Coupling Floating Wind Turbines with Large-Scale Air- Conditioning Systems Through Deep Sea Water Pumping: Case Studies of System Performance in European Deep Waters	925
Tonio Sant, Robert N. Farrugia and David Arroyo López-Carro	
84 Denmark Wind Energy Programme	941
Wen Zhong Shen	
85 Development of Realistic Demand Side Management Strategies Using Artificial Neural Networks for the Production of Informative Wind Speed Prediction Signals	951
D. Zafirakis, K. Moustris, Ch. Maragos, M. Stathopoulos and G. Tzanes	
86 Comparative Study of Two Types of Wind Turbine Simulators for Wind Energy Conversion System	961
Gyeong-Hun Kim, Jin-Hong Jeon, Jong-Yul Kim, Jong-Bo Ahn, Chulsang Hwang and Eung-Sang Kim	
87 Wind Power Is the Last to Be Stored	969
Donald Swift-Hook	
Index	979

Renewable Energy in the Service of Mankind Vol I
Selected Topics from the World Renewable Energy
Congress WREC 2014

Sayigh, A. (Ed.)

2015, XXIX, 985 p. 514 illus., 401 illus. in color.,

Hardcover

ISBN: 978-3-319-17776-2