

# **2nd International Conference on Sustainable Energy Engineering and Application**

**(ICSEEA 2014)**

**Sustainable Energy for Green Mobility**

**Energy Procedia Volume 68**

**Bandung, Indonesia  
14-16 October 2014**

**Editors:**

**Rosli bin Abu Bakar, Craig Froome**

**ISBN: 978-1-5108-0461-6**

**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. (2015)

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: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>Preface .....</b>	1
<i>Rosli bin Abu Bakar, Craig Froome</i>	
<b>Study on Thermal-fluid Effect of Thermal Energy Storage Tank Design in Solar Energy Applications .....</b>	3
<i>Tanti Ali, Rosli Abu Bakar, Billy Anak Sup, Mohd Farid Zainudin, Gan Leong Ming</i>	
<b>The Electricity Power Potency Estimation from Hot Spring in Indonesia with Temperature 70-80°C Using Organic Rankine Cycle.....</b>	12
<i>Ghalya Pikra, Nur Rohmah, Rakhmad Indra Pramana, Andri Joko Purwanto</i>	
<b>Maximum Power Point Tracking for Photovoltaic Using Incremental Conductance Method .....</b>	22
<i>Ratna Ika Putri, Sapto Wibowo, Muhamad Rifa'i</i>	
<b>Cr/<math>\alpha</math> -Cr<sub>2</sub>O<sub>3</sub> Monodispersed Meso-spherical Particles for Mid-temperature Solar Absorber Application .....</b>	31
<i>S. Khamlich, M. Maaza</i>	
<b>Fabrication of Dye Sensitized Solar Cells with Spray Coated Carbon Nano Tube (CNT) Based Counter Electrodes .....</b>	37
<i>Slamet Widodo, Goib Wiranto, Mirza Nur Hidayat</i>	
<b>Effect of Rim Angle to the Flux Distribution Diameter in Solar Parabolic Dish Collector .....</b>	45
<i>Billy Anak Sup, Mohd Farid Zainudin, Tanti Zanariah Shamsir Ali, Rosli Abu Bakar, Gan Leong Ming</i>	
<b>Performance of a Recirculation Type Integrated Collector Drying Chamber (ICDC) Solar Dryer.....</b>	53
<i>Yefri Chan, Nining Dyah, Kamaruddin Abdullah</i>	
<b>Astronomy Algorithm Simulation for Two Degrees of Freedom of Solar Tracking Mechanism Using Clanguage .....</b>	60
<i>Midriem Mirdanies</i>	
<b>Pre-installation Design Simulation Tool for Grid-connected Photovoltaic System Using Iterative Methods .....</b>	68
<i>Nur Dalilah Nordin, Hasimah Abd Rahman</i>	
<b>Optimization Active and Reactive Power Flow for PV Connected to Grid System Using Newton Raphson Method.....</b>	77
<i>Refdinaz Nazir, Kiki Kanada, Syafii, Prima Coveria</i>	
<b>The Effect of Plate Spacing in Plate Heat Exchanger Design as a Condenser in Organic Rankine Cycle for Low Temperature Heat Source .....</b>	87
<i>Nur Rohmah, Ghalya Pikra, Andri Joko Purwanto, Rakhmad Indra Pramana</i>	
<b>Fuzzy Logic-Based Voltage Controlling Mini Solar Electric Power Plant as an Electrical Energy Reserve for Notebook .....</b>	97
<i>Ilhami Fajri, Refdinaz Nazir</i>	
<b>Comparison of SHF and SSF Processes Using Enzyme and Dry Yeast for Optimization of Bioethanol Production from Empty Fruit Bunch.....</b>	107
<i>Deliana Dahnum, Sri Octavia Tasum, Eka Triwahyuni, Muhammad Nurdin, Haznan Abimanyu</i>	
<b>Improving Quantity and Quality of Castor Bean Oil for Biofuel Growing under Severe Conditions in Egypt.....</b>	117
<i>Mehanna Hani Mohamed, Hussein Mohamed Mursy</i>	
<b>Economic Analysis of Cow Manure Biogas as Energy Source for Electricity Power Generation in Small Scale Ranch .....</b>	122
<i>Arini Wresta, Dian Andriani, Aep Saepudin, Henny Sudibyo</i>	
<b>Bioethanol from Sorghum Grain (<i>Sorghum bicolor</i>) with SSF Reaction Using Biocatalyst Co-Immobilization Method of Glucoamylase and Yeast .....</b>	132
<i>Endah R. Dyartanti, Margono, Sunu H. Pranolo, Budi Setiani, Anni Nurhayati</i>	
<b>The Effect of Substrate Loading On Simultaneous Saccharification And Fermentation Process For Bioethanol Production from Oil Palm Empty Fruit Bunches .....</b>	138
<i>Eka Triwahyuni, Murjantoro, Yanni Sudiyani, Haznan Abimanyu</i>	
<b>Evaluation of Performance and Emission of SI Engine Fuelled with CNG at Low and High Load Condition .....</b>	147
<i>Y. Putrasari, Achmad Praptijanto, Arifin Nur, Bambang Wahono, W.B. Santoso</i>	
<b>Torrefaction of Indonesian Sugar-cane Bagasse to Improve Bio-syngas Quality for Gasification Process .....</b>	157
<i>Daniyanto, Sutidjan, Deendarlianto, Arief Budiman</i>	

<b>Performance Characteristic of Indirect Diesel Engine Fuelled with Diesel-bioethanol Using Uniplot Software.....</b>	167
<i>Arifin Nur, Y. Putrasari, W.B. Santoso, Tony Kosasih, I.K. Rekswardojo</i>	
<b>The Potential of Nyamplung (<i>Calophyllum inophyllum</i> L.) Seed Oil as Biodiesel Feedstock: Effect of Seed Moisture Content and Particle Size on Oil Yield .....</b>	177
<i>Muhammad Fadhlullah, Sri Nanan B. Widiyanto, Elvi Restiawaty</i>	
<b>Life Cycle Assessment-based Environmental Impact Comparative Analysis of Composting and Electricity Generation from Solid Waste .....</b>	186
<i>Ahmed Elwan, Y.Z. Arief, Zuraimy Adzis, N.A. Muhamad</i>	
<b>Effect of Combining Chemical and Irradiation Pretreatment Process to Characteristic of Oil Palm's Empty Fruit Bunches as Raw Material for Second Generation Bioethanol .....</b>	195
<i>Anis Kristiani, Nurdin Effendi, Yosi Aristiawan, Fauzan Aulia, Yanni Sudiyani</i>	
<b>Pre-study on Potential Electrical Energy Savings in Malaysia Dairy Manufacturing Industry of Medium Enterprises .....</b>	205
<i>N.A. Muhamad, Lee Yun Phing, Y.Z. Arief</i>	
<b>A Review of Recycling of Human Excreta to Energy through Biogas Generation: Indonesia Case.....</b>	219
<i>Dian Andriani, Arini Wresta, Aep Saepudin, Budi Prawara</i>	
<b>Comprehensive Evaluation of Integrated Energy Plantation Model of Palm Oil and Microalgae Based Biofuel for Sustainable Energy Production .....</b>	226
<i>Nugroho Adi Sasongko, Ryozi Noguchi</i>	
<b>Reuse Black Liquor of Alkali Pretreatment in Bioethanol Production.....</b>	236
<i>Muryanto, Eka Tri wahyuni, Hendris Hendarsyah, Haznan Abimanyu</i>	
<b>Optimization Design of Savonius Diffuser Blade with Moving Deflector for Hydrokinetic Cross Flow Turbine Rotor .....</b>	244
<i>Bagus Wahyudi, Sudjito Soeparman, H.W.M. Hoeijmakers</i>	
<b>Decolorization of Black Liquor Wastewater Generated from Bioethanol Process by Using Oil Palm Empty Fruit Bunches .....</b>	254
<i>Ajeng Arum Sari, Hendris Hendarsyah Kurniawan, Muhammad Nurdin, Haznan Abimanyu</i>	
<b>Design Optimization of Axial Hydraulic Turbine for Very Low Head Application .....</b>	263
<i>Abdul Muis, Priyono Sutikno, Aryadi Soewono, Firman Hartono</i>	
<b>Experimental Study for the Single-stage and Double-stage Two-bladed Savonius Micro-sized Turbine for Rain Water Harvesting (RWH) System.....</b>	274
<i>Norzanah Rosmin, Ahmad Safwan Jauhari, Aede Hatib Mustaamal, Faridah Husin, Mohammad Yusri Hassan</i>	
<b>Preparation and Characterization of 5 wt.% Epoxy Resin Bonded Magnet NdFeB for Micro Generator Application .....</b>	282
<i>Muljadi, Priyo Sardjono, Suprapedi</i>	
<b>Design of CAN Bus for Research Applications Purpose Hybrid Electric Vehicle Using ARM Microcontroller .....</b>	288
<i>Kristian Ismail, Aam Muhamram, Mulia Pratama</i>	
<b>An Experimental Study on the Performance of Savonius Wind Turbines Related With The Number of Blades.....</b>	297
<i>Frederikus Wenehnenbun, Andy Saputra, Hadi Sutanto</i>	
<b>Process Manufacture Rotor Radial Turbo-expander for Small Scale Organic Rankine Cycles Using Selective Laser Melting Machine.....</b>	305
<i>Maulana Arifin, Bambang Wahono, Endro Junianto, Ari Darmawan Pasek</i>	
<b>Performance of Polymer Electrolyte Membrane Fuel Cell During Cyclic Activation Process .....</b>	311
<i>Yuyun Irmawati, Indriyati</i>	
<b>Hydrogen Absorption Capacity of Fe-Ti-Al Alloy Prepared by High Energy Ball Milling .....</b>	318
<i>Martinus D. Kurnia Dewa, Slameto Wiryalukito, Hadi Suwarno</i>	
<b>Electric Vehicle Mobile Charging Station Dispatch Algorithm .....</b>	326
<i>Tinton Dwi Atmaja, Midriem Mirdianes</i>	
<b>Analysis of Dominants' Factors of National Renewable Energy Strategy .....</b>	336
<i>Bambang Sugiyono Agus Purwono, Rahbini, Ubud Salim, Djuwahir, Solimin</i>	
<b>Effect of Ethanol Percentage for Diesel Engine Performance Using Virtual Engine Simulation Tool.....</b>	345
<i>Achmad Praptijanto, Aam Muhamram, Arifin Nur, Y. Putrasari</i>	
<b>Performance Analysis of A Spark Ignition Engine Using Compressed Natural Gas (CNG) as Fuel.....</b>	355
<i>Musthafah Mohd. Tahir, M.S. Ali, M.A. Salim, Rosli A. Bakar, A.M. Fudhail, M.Z. Hassan, M.S. Abdul Muhaimin</i>	
<b>The Selection of Time Step in Runge Kutta Fourth Order for Determine Deviation in the Weapon Arm Vehicle .....</b>	363
<i>Aditya Sukma Nugraha</i>	
<b>Review of Electrostatic Precipitator Device for Reduce of Diesel Engine Particulate Matter .....</b>	370
<i>Agung Sudrajad, Ahmad Fitri Yusof</i>	

<b>Controlling Unmanned Ground Vehicle Via 4 Channel Remote Control.....</b>	381
<i>Hendri Maja Saputra, Midriem Mirdanies</i>	
<b>Design of Single Acting Pulley Actuator (SAPA) Continuously Variable Transmission (CVT) .....</b>	389
<i>Nur Cholis, Sugeng Ariyono, Gigh Priyandoko</i>	
<b>A Numerical Investigation About The EGR Effect Under The Condition of Boost Pressure on HCCI Autoignition.....</b>	398
<i>Chung Hwan Oh, Narankhuu Jamsran, Ock Taeck Lim</i>	
<b>Analysis of Range Extender Electric Vehicle Performance Using Vehicle Simulator .....</b>	409
<i>Bambang Wahono, W.B. Santoso, Arifin Nur, Amin</i>	
<b>Thermodynamic Cycle Evaluation of Rhombic Drive Beta-configuration Stirling Engine.....</b>	419
<i>Mohd Farid Zainudin, Rosli Abu Bakar, Gan Leong Ming, Tanti Ali, Billy Anak Sup</i>	
<b>Energy Storage System Using Battery and Ultracapacitor on Mobile Charging Station for Electric Vehicle .....</b>	429
<i>Tinton Dwi Atmaja, Amin</i>	
<b>Computational Analysis of Thermal Building in a No-uniform Thermal Environment.....</b>	438
<i>Norfadzilah Jusoh, Rosli Abu Bakar, Ahmad Rasdan Ismail, Tanti Zanariah Shamshir Ali</i>	
<b>Electric Vehicle Conversion Based on Distance, Speed and Cost Requirements .....</b>	446
<i>Sunarto Kaleg, Abdul Hapid, M. Redho Kurnia</i>	
<b>Long-term Electricity Demand Forecasting of Sumatera System Based on Electricity Consumption Intensity and Indonesia Population Projection 2010-2035 .....</b>	455
<i>Suhono, Sarjiya</i>	
<b>Measuring Geometric and Kinematic Properties to Design Steering Axis to Angle Turn of The Electric Golf Car.....</b>	463
<i>Muhammad Khristamto, Achmad Praptijanto, Sunarto Kaleg</i>	
<b>High Reliability of MEMS Packaged Capacitive Pressure Sensor Employing 3C-SiC for High Temperature .....</b>	471
<i>Noraini Marsi, Burhanuddin Yeop Majlis, Azrul Azlan Hamzah, Faisal Mohd-Yasin</i>	
<b>Sonochemistry Approach to Reducing Biodiesel Reaction Time From <i>Jatropha Curcas</i> Oil by Clamp on Tubular Reactor .....</b>	480
<i>Achmad Praptijanto, Egi Agustian, Y. Putrasari, Darwin Sebayang, Anika Zafiah M. Rus, Sulaiman Hasan, Pudji Untoro</i>	
<b>Author Index</b>	