

# **2012 International Conference on Future Energy, Environment, and Materials**

**(FEEM 2012)**

**Energy Procedia Volume 16, Part C**

**Hong Kong  
12-13 April 2012**

**Editors:**

**Yang Guohui**

**ISBN: 978-1-62993-564-5**

**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. (2014)

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)

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)**SciVerse ScienceDirect**

Energy Procedia 16 (Part C) (2012) iii–v

---

---

Energy  
**Procedia**

---

## Contents

Study on the Multi-products Dynamic Pricing Model under Uncertain Demands L. Li, T. Zhang .....	1401
Fuzzy Neural Network Control Technique and its Application in a Complex Intersection Y. Xie, G. Shen, X. Chen .....	1408
Research of Harmonics Measurement Algorithm based on HHT S. Zhang .....	1416
Evaluation of the Degree of Sudden Natural Disasters Affected – A Case Study of Typhoon “Bilis” T. Zhao, H. Fan, G. Wang, J. Zhang, Z. She .....	1424
Variable Parameter Equivalent Model of Transmission Line based on Dual-Port Norton Equivalence X. Zhou, Y. Wang .....	1433
Transferred Power Control for ICPT Pick-Ups Utilizing Dynamically Switched Inductor M. Yang, X. Li, Z. Ao, Y. Wang .....	1440
Fault Diagnosis of Gas Turbine based on Fuzzy Matrix and the Principle of Maximum Membership Degree X. Zhao, Y. Liu, X. He .....	1448
Hybrid of ARIMA and SVMs for Short-Term Load Forecasting H. Nie, G. Liu, X. Liu, Y. Wang .....	1455
The Experimental Study between Inside Fluid and Outside Wall Temperature of Enclosed Container S. Sun, W. Li .....	1461
Study on New Thermal Insulation Construction of Thermal Recovery Boiler H. Zhao, X. Liu, L. Liu, Y. Wu, X. Li, Y. Zhou .....	1466
Research of Novel Measuring Method in Photovoltaic Grid-Connected Regulation and Control System Y. Tang, H. Yang .....	1472
Research on Harmonic Suppression in Power System based on Improved Adaptive Filter L. Zeng, X. Li .....	1479
The Research on the Performance of an Ejector-Type Anti-Splash Water Injector H. Jia, Z. Wang, S. Wang .....	1487
The Application of LabVIEW in Data Acquisition System of Solar Absorption Refrigerator L. Wang, Y. Tan, X. Cui, H. Cui .....	1496
Study on Solar-Assisted Cascade Refrigeration System L. Wang, A. Ma, Y. Tan, X. Cui, H. Cui .....	1503
Experimental Study on Enhanced Heat Transfer Characteristics of Synergistic Coupling between the Pulsating Heat Pipes J. Liu, F. Shang, D. Liu .....	1510
Study of the Input-Output Overall Performance Evaluation of Electricity Distribution based on DEA Method Y. Shen, Zhangna .....	1517
Dynamic Characteristic Analysis of Doubly-Fed Induction Generator Low Voltage Ride-Through L. Shi, N. Chen, Q. Lu .....	1526
The Analysis and Research of OPC XML-DA Server Y. Yin, Z. Bin .....	1535
Implementation of Step Motor Control under Embedded Linux based on S3C2440 S. Wang, Z. Heng, H. Tan, L. Jiang .....	1541
Research for Digital DC PWM Controlling System X. Shi, L. Iu, S. Hang .....	1547
The Characters of Quaternary Scaling Functions and their Generators with Twelve-Scale Dilatation Factor J. Xiang .....	1553
Evaluation and Characters of Dual Binary Pseudoframes with Filter Functions L. Liu, J. Xiang .....	1561
On the Estimation of Daily Beam Radiation on Tilted Surfaces Y. Yang, G. Li, R. Tang .....	1570
Design of Inquiry Virtual Experiment Platform Y. Rui .....	1579
A New Dynamic Assessment for Multi-Parameters Information of Water Inrush in Coal Mine J. Ma, Y. Zhang .....	1586
Research on Flow Diagram and Improved Algorithm Criteria of Control Mode Selection at Plane Intersection J. He, K. Wu, X. Du, J. Dai, C. Jin .....	1593
Wide-Area Protection Research in the Smart Grid L. Lei, N. Tai, G. Yang .....	1601
Software Design of Dual CPU Controlled Digital Protection Device X. Yang, Y. Xu, X. Lei, N. Yang, S. Zhang .....	1607

The Reliability Evaluating Method Considering Component Aging for Distribution Network T. Wang, Y. Wu . . . . .	1613
CIM-based Data-Sharing Scheme for Online Calculation of Theoretical Line Loss Z. Yan, Y. Zhu, X. Bai, H. Wei . . . . .	1619
The Radial Displacement of the HPT Blade under the Effects of the Temperature Field and the Centrifugal Y. Fang, Y. Liu, Y. Yu, X. He . . . . .	1627
The Application of Fuzzy PID Control in Pitch Wind Turbine Y. Qi, Q. Meng . . . . .	1635
Treatment of Synthetic Wastewater in a Pre-Denitrification Biofilm Reactor Packed with Polyurethane Media C. Jiang, X. Zhi, Q. Fei, H. Guo . . . . .	1642
Research on Controlling Strategy of Dual Bridge Matrix Converter-Direct Torque Control of Induction Motor Y. Li, H. Wei . . . . .	1650
Research and Application of a New Fuzz-Test Framework T. Wang, Y. Li, Y. Ma, G. Wei . . . . .	1659
Constitution and Optimization on the Performance of Microbial Fuel Cell based on Sulfate-Reducing Bacteria D. Yu, G. Wang, F. Xu, L. Chen . . . . .	1664
Research Progress of Biofouling Extracellular Polymeric Substances in Cooling Water System D. Yu, Y. Xu, Z. Jing, G. Wang, S. Cao . . . . .	1671
New Power Management Strategies for a Microgrid with Energy Storage Systems X. Kong, Z. Liu, J. Zhang . . . . .	1678
Hardware-in-the-Loop Simulation of Traction Control Algorithm based on Fuzzy PID L. Chu, L. Chao, O. Yang, W. Lu . . . . .	1685
Research on a Stand-Alone Photovoltaic System with a Supercapacitor as the Energy Storage Device J. Li, C. Yu, Y. Liu . . . . .	1693
Progress of Grover Quantum Search Algorithm L. Luan, Z. Wang, S. Liu . . . . .	1701
Design on IPNCS of Electrical Propulsion Ship based on Real-Time Ethernet H. Lu . . . . .	1707
Electrochemical Modification of Physicochemical Soft Rock J. Li, D. Wang, T. Kang . . . . .	1714
Application of Assignment Model in PE Human Resources Allocation X. Ma . . . . .	1720
Influence of the Power Pricing Policies in the Energy-Intensive Industry on the Power Demand: Taking Ningxia as the Example G. Luo, X. Zhang . . . . .	1724
Action of Internal Cnoidal Wave on Pile Y. Cheng, G. Fei, Y. Dang . . . . .	1731
Tensile Strength of Hygrothermally Conditioned Carbon/Epoxy Composites with Voids A. Zhang, D. Zhang, D. Li, T. Sun, H. Xiao, J. Jin . . . . .	1737
Optical Performance of Horizontal Single-Axis Tracked Solar Panels G. Li, R. Tang, H. Zhong . . . . .	1744
Recursive Integral with Fuzzy Control Method used in Shunt Hybrid Active Power Filter Z. Wei, R. Chen, L. An . . . . .	1753
A Class of Optimal Control Problems on Time Scales Y. Peng . . . . .	1760
Study of Power System Online Dynamic Equivalent based on Wide Area Measurement System Y. Zhou, K. Wang, X. Yumin, B. Zhang . . . . .	1768
Survivability Analysis of Ethernet Passive Optical Network Applied in Strong Smart Grid Z. Wei, G. Shou, Z. Guo, Y. Hu . . . . .	1776
Research on Arc-Grounding Overvoltage in the 10kV Distribution System S. Feng, L. Zheng, J. Lie, Y. Sun, G. Chen, X. Ji . . . . .	1785
An Obstacle Avoidance Method of Soccer Robot based on Evolutionary Artificial Potential Field Q. Zhang, D. Chen, T. Chen . . . . .	1792
A Gait Planning Method for Biped Heel-and-Toe Robot Q. Zhang, D. Chen, H. Li . . . . .	1799
Carbon Capture and Storage in the Power Industry: Challenges and Opportunities C. Fu, T. Gundersen . . . . .	1806
Random Wind-Induced Response Analysis of Transmission Tower-Line System Q. Li, J. Yuan, W. Li . . . . .	1813
Application of PLL in the Generator-Side Converters for Doubly-Fed Wind Power Generation Systems Y. Liu, Z. Chen, J. Shen . . . . .	1822
Simulation for the Secondary Loop of the Chinese 200Mwe HTR-PM base on Vpower Dongliyu, Z. Zhou, S. Zhe, Y. Ma, S. Zhou . . . . .	1831
The Application of Intelligent Fuzzy Inference to the Fault Diagnosis in Pitch-Controlled System H. Liu, X.-H. Dong, Z.-L. Yang, Z. Kai . . . . .	1839
Analysis based on Improved Method for Transformer Harmonic Losses C. Pan, L. Kong, Z. Li, Q. Zheng, Z. Wang . . . . .	1845
Power System Load Forecasting based on Fuzzy Clustering and Gray Target Theory H. Jing, D. Liu, Z. Li, Z. Chen, L. Kong . . . . .	1852

Study on the Time Decreasing Trend Model of Condenser Cleanliness Coefficient W. Lei, R. Zhang, Z. Xiao, Y. Xia . . . . .	1860
A Synthesis of Methodologies and Practices for Developing Driving Cycles X. Zhang, D.-J. Zhao, J.-M. Shen . . . . .	1868
Biodiesel: an Alternative to Conventional Fuel D. Huang, H. Zhou, L. Lin. . . . .	1874
Influence of Pulse Discharge on Pore Structure and Surface Properties of Activated Carbon Y.-Z. Zhang, Z. Wei, Y. Han, X.-Y. Xiong, Y. Zhang . . . . .	1886
The Evaluation Grades of Health Risk based on the SPA Model D. Yu, F. Ni . . . . .	1891
Disastrous Forecasting of Fire Accidents in Assembly Occupancies Z. Mao . . . . .	1899
Research on Performance High-Speed Multi-Stage Cylinder Linear Induction Motor X. Guan, B. Lei, Z. Li, Z. Ran . . . . .	1904
Principal Component Analysis of Electricity Consumption Factors in China J. Zhang, X. Yang, F. Shen, Y. Li, X. Hong, H. Qi, H. Peng, S. Deng . . . . .	1913
The Influence of Environment on a Prey-Taxis System? X. Li, J. Hu, F. Xia, M. Ma . . . . .	1919
Potato Late Blight Control using <i>R</i> -Gene Polyculture by GMO C. Xin, N. Li, J. Guo . . . . .	1925
The Influence of Different Seed Dressing Treatments on Wheat Seedlings Growth under Water Stress Conditions X. Wu, Z. Gao, Y. Zha, Y. Li, M. Lu, D. Cai . . . . .	1930
The Industrial Design Education based on the Lifecycle Design X. Guo, Y. Guo, Y. Cao, P. Lin . . . . .	1935
The Electric Power Saving Schemes of High Speed Electrified Railway Y. Xiong, Y. Duan, Y. Zhou, B. Zhang, J. Sun . . . . .	1940
Application of Detecting Part's Size online based on Machine Vision Y. Tian, S. Liu, Q. Tan . . . . .	1948
Research and Design on IGBT Induction Heating Power Supply Y. Wang, Y. Li, Y. Peng, X. Qi . . . . .	1957
Effects of Pre-Fermentation and Influent Temperature on the Removal Efficiency of COD, NH <sub>4</sub> <sup>+</sup> -N and PO <sub>4</sub> <sup>3-</sup> -P in Slaughterhouse Wastewater by Using SBR Y. Jia, C. Gao, L. Zhang, G. Jiang . . . . .	1964
Real-Time Simulation and Analyses of Ship Energy Management System Network Q. Mei, Z. Wu, J. Han . . . . .	1972
Coordination of Generation and Transmission Planning for Power System with Large Wind Farms X. Ma, Y. Zhou . . . . .	1979
Research of Solar Inverter based on Silicon Carbide JFET Power Device S. Pan, L. Li, Z. Chen . . . . .	1986
Computational Model of Silicon Carbide JFET Power Device X. Hao, S. Pan . . . . .	1994
Analysis of Security based on CDMA Air Interface System C. Dan, Y. Liu, J. Tang . . . . .	2003
A 3E Model on Energy Consumption, Environment Pollution and Economic Growth ---An Empirical Research based on Panel Data Y. Xia, M. Xu . . . . .	2011
Indigenous R&D, Technology Imports and Energy Consumption Intensity: Evidence from Industrial Sectors in China Y. Teng . . . . .	2019
Study of Fault Diagnosis of Integrate of D-S Evidence Theory based on Neural Network for Turbine C. Xu, H. Zhang, D. Peng, Y. Yu, C. Xu, H. Zhang . . . . .	2027
The Monitor of Inter-area Oscillation based on Wide Area Measurement System X. Dong, Q. Huang, Y. Chang . . . . .	2033
Current Status of EV Technology in China based on Expert Interview X. Ou, X. Zhang . . . . .	2044
Study on Power Generation and Energy Storage System of a Solar Powered Autonomous Underwater Vehicle(SAUV) Y. Hu, J. Wang . . . . .	2049
Biodegradation of Microcystins by <i>Bacillus</i> sp. strain EMB L. Hu, F. Zhang, C. Liu, M. Wang . . . . .	2054
Oxidation Rate of Sodium Sulfite in Presence of Inhibitors S. Cui, L. Wang, S. Hao, L. Du . . . . .	2060
The Impact of Common Rail System's Control Parameters on the Performance of High-Power Diesel X.-G. Tan, H.-L. Sang, Q. Tao, Z.-Q. Fan, W.-H. Yin . . . . .	2067
Study on A United Evaluation Algorithm and its Applications for Economic Operation of Transformer W. Zhang, T. Li, X. Yuan . . . . .	2073
Study and Application of Variable Period Sampling in Strap-Down North Seeking System M. Xie, L. Li, Z. Wang . . . . .	2081
Research on Mechanism of over Current When Non-Contact On-Load Tap Changer Regulating Voltage Y. Zhao, S. Meng, S. Dong, S. Wei . . . . .	2087