2023 IEEE PES Innovative Smart Grid Technologies – Asia (ISGT Asia 2023)

Auckland, New Zealand
21-24 November 2023

IEEE Catalog Number: CFP23ISK-POD
ISBN: 979-8-3503-2775-5

Copyright © 2023 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:	CFP23ISK-POD
ISBN (Print-On-Demand):	979-8-3503-2775-5
ISBN (Online):	979-8-3503-2774-8
ISSN:	2378-8534

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
Web: www.proceedings.com

TABLE OF CONTENTS

An Investigative Study for the Commercialization of Anion Exchange Membrane-Based Unitized Regenerative Fuel Cell 1
Eun-Chong Lee, Byung-Wook Lee, Hyung-Man Kim

Thermally Limiting Grid Assets for Temporary Admissible Transmission Loading (TATL) in Curative Congestion Management 6
Jonas Mehlem, Muriel Krüger, Albert Moser

Voltage and Current Dynamics-Canceled Virtual Synchronous Generators for Stability Guarantee 11
Weihua Zhou, Nabil Mohammed, Behrooz Bahrani

Optimal Allocation of D-STATCOM Devices with Improved Quantum Brain Storm Optimization in Hybrid Code 16
Y. Kawauchi, H. Mori, N. Someya

An Evolutionary Computation Method for Selecting Pilot Buses with Clustering-Based Robust Optimization 21
Rikuto Miwa, Hiroyuki Mori

Revolutionizing EV Adoption: Enhancing User Participation Through SOC Strategies Incorporating Degradation-Dependent Economic Model for Battery Swapping Stations 26
Muhammad Osama Tarar, Ayesha Khan, Naveed Ul Hassan, Ijaz Haider Naqvi

Exploring Battery Degradation and Range Variability in Electric Vehicles Across Global Drive Patterns and Charging Levels 31
Ayesha Khan, Ijaz Haider Naqvi, Naveed Ul Hassan

Life Cycle Assessment of Green Hydrogen Production Via Geothermal Energy-Driven Electrolysis 36
Anurag Chidire, Christopher Schifflechner, Tobias Massier

Preparing for an Increase in Inverter-Based Resources in New Zealand 41
Nuwan Herath, Nyuk-Min Vong, Mattew Copland

Ground Source Heat Pump System Based on Residential Building 46
Pengcheng Hu, Abhisek Ukil, Nirmal Nair

Sliding Mode Observer Based FCS-MPC Control of Voltage Source Inverter 51
Pengxiang Jing, Xibeng Zhang, Abhisek Ukil, Akshya Swain

A Preliminary Study of Temporal Variables Reduction to Reduce Computational Time of V2G Scheduling in Stochastic Programming Approach 56
Shigeru Tamura, Hiroto Kimura

Planning for Inertia and Resource Adequacy in a Renewable-Rich Power System 61
Amir Fayaz Heidari, Amin Masoumzadeh, Maria Vrakopoulou, Tansu Alpcan

Bi-Level Optimal Energy Management in Distribution Networks with Partial Penetration of Smart Home Energy Management Systems 66
Kuthsav Thattai, Shuheng Chen, Boyu Liu, Jayashri Ravishankar

An Open Optimal Power Flow Model for the Australian National Electricity Market 71
Rahmat Heidari, Matthew Amos, Frederik Geth

Evaluating the Financial Viability of Vehicle-To-Grid for Autonomous Electric Ride-Hailing Fleets 76
Linda Punt

A Novel Virtual Impedance Method for Interfacing Renewable to Grid with High Impedance 81
Phuoc Sang Nguyen, Ghavameddin Nourbakhsh, Gerard Ledwich

Evaluating Demand Response Potential of Air Conditioners in Residential Sector: A Data-Driven Approach Estimating Room Temperature 86
Tetsushi Ono, Aya Hagishima, Jun Tanimoto

An Improved Control Method for Type-IV Wind Turbine Connected to Weak Grid Systems 91
Hailong Wang, Jeremy D. Watson, Neville R. Watson

Grid Congestion Management Using Grouping of Renewable Energies Based on Sensitivity Analysis and Grid Congestion Amount of Transmission Lines 96
Yujiro Tanno, Akihisa Kaneko, Yasuhiro Hayashi, Yuki Itoda, Wataru Wayama, Choei Takahashi

Electricity Exchange Between Control Areas Due to Tie Line Expansion and Demand Shifting Using Unit Commitment in Japan 101
Shoki Okawara, Yusuke Manabe, Nobuyuki Yamaguchi

Communication-Free Control Concept for Operating a Low Voltage Island Grid 106
Iwo Bekker, Lutz Hofmann

Sharing Battery Energy Storage System to Promote RE100 111
Soichiro Hashiba, Hiroki Satoh, Yu Ikemoto

Neural Network Based Fault Location in Power Distribution System 114
Viresh Patel, Soumyajit Ghosh, Saikat Chakrabarti, Ankush Sharma, Sanjeev Pannala

Effect of Linked Block Orders on Day-Ahead Energy Market Using Multi-Agent Simulation 120
Kohei Chakihara, Nobuyuki Yamaguchi

Building Energy Management Considering Nonlinearity of Electric Equipment with PV-Battery Systems During Power Outage 125
Yuta Kimura, Nobuyuki Yamaguchi, Fuyuki Sato, Takuma Mineyuki, Hiroki Kawano

Time-Series Clustering of UK Non-domestic Consumers for Demand Response Aggregators 130
Maitha Al Shimmari, Jan-Peter Calliess, David Wallom

Resonant Frequency Analysis of Dual Inverter-Based Resources with LCL Filters in Offshore Wind Farm 135
Ji-Min Lee, Gyu-Sub Lee

Effects of Capacity Factor on Sizing of Energy Storage Systems for Electric Vehicle Charging Plazas 140
Kari Lappalainen, Jan Kleissl

Experience of Reactive Capability Assessment of RE Plant in Western Region of India 145
Vishal Puppala, Pushpa Seshadri, Manoj Thakur, Srinivas Chitturi, Pradeep Sanodiya, Minnakuri Venkateswara Rao, Omkar Kumbhar

Prioritization of Distribution Networks with Distributed Energy Resources for Efficient Deployment of Loss Minimum Reconfiguration Technology 150
Kei Hagiwara, Yu Fujimoto, Yasuhiro Kodama, Yasuhiro Hayashi, Ryo Maeda, Kohei Oishi, Kenjiro Mori

A Comparison Study on the Performance of Different MPPT Control Strategies in DC Microgrids with Photovoltaic Systems 155
Dongze Li, Qian Hu

A Marginal Power Generation Cost Estimation Method Based on Probability Interval Accumulation Considering Bounded Rationality 161
Qinghu Tang, Hongye Guo, Feng Li, Zichao Sun, Qixin Chen

Optimisation of Transient Stability for Integration of Offshore Oil Rigs with Offshore Wind 166
Jing Zhong Tee, Lai Meng Tang, Idris Li Hong Lim

A Linear Model for Estimating Power Generation on City Facade Using a City 3D Model and Solar Power Generation Simulation 171
Guanglei Li, Shinji Yokogawa

Modeling of a Grid-Following Inverter Considering the Relationship Between PCC and POC Voltages 175
Nobuaki Kawashima, Ryoichi Hara, Hiroyuki Kita, Hideo Ishii

Robust Operating Envelopes with Phase Unbalance Constraints in Unbalanced Three-Phase Networks 180
James Stanley Russell, Paul Scott, José Iria

Electrolyzer Cost Projections Compared to Actual Market Costs: A Critical Analysis 185
Hadi Vatankhah Ghadim, Rafaella Canessa, Jannik Haas, Rebecca Peer

The Impact of Energy Communities on Electricity Distribution Business — Aspects on Seasonal Turnover Risks for the Distribution System Operator 190
Kimmo Lummi, Juha Koskela, Pertti Järventausta

A Study on the Installed Capacity of Energy Supply System in a Household 195
Ken Yamamoto, Koji Kawahawara

Framing Barriers for Distribution Grid Digitalisation: A Conceptual Framework for Policy Recommendation 200
Roberto Monaco, Claire Bergaentzle, Per Sieverts Nielsen, Konrad Sundsgaard

Comparison of Adapted PSO Methods Regarding the Determination of Grid Operation Constraints in the Vertical Active and Reactive Power Plane 205
M. Wingenfelder, L. Hofmann

Generation of Realistic Smartmeter Data 210
Ali Othman, Neville R. Watson, Andrew Lapthorn, Radnya Mukhedkar

Leveraging Digital Twins and Demand Side Recommender Chatbot for Optimizing Smart Grid Energy Efficiency 215
Abiodun E. Onile, Juri Belikov, Eduard Petlenkov, Yoash Levron

Introducing Digitalisation to Component Risk Models: Enhancing Regulatory Effectiveness 220
Konrad Sundsgaard, Roberto Monaco, Jose Angel Leiva Vilaplana, Claire Bergaentzlé, Jens Zoëga Hansen, Guangya Yang

Innovating the Way Out of the Energy Crisis: Commercialization Pathways of Home Energy Management User-Innovations 225
Tuukka Huosianmaa, Jussi Valta, Ulla A. Saari

Municipalities' Ecosystem Roles in Different Energy Communities 230
Jussi Valta, Anne-Lorene Vernay, Tuomas Vanhanen, Raúl Castaño-Rosa, Ulla Saari

A New Forecasting Method for Wind Power Generation Output with Wavelet ELM-Type Radial Basis Function Network 235
Kohtaro Watanabe, Hiroyuki Mori

Application of Quantum Brain Storm Optimization to Robust State Estimation in Distribution Systems 240
Akio Ito, Hiroyuki Mori

Modelling and Control of Dual Active Bridge DC-DC Converters in DC Grids 245
Choidorj Adiyabazar, Josh Schipper, Jeremy Watson, Alan Wood

Application of a Multi-Horizon Multi-Energy Optimization Model for a European Case Study 250
Julian Walter, Sebastian Goertz, William Inghelram, Albert Moser

Planning and Management of Distributed Energy Resources for Achieving the Target Renewable Energy Rate in Distribution Systems 255
Sota Miyazaki, Akihisa Kaneko, Yasuhiro Hayashi, Shunsuke Kawano, Masayuki Kagita, Keishi Matsuda, Nobuhiko Itaya

Performance Evaluation of Northern Regional Transmission System of India: Critical Analysis for Grid Resilience 260
Prashant Garg, Priyanshi Aggarwal, Sheikh Shadruddin, Somara Lakra, R. K. Porwal

Internal System Losses of Renewable Energy Sources and Their Influence on the Economic Efficiency of the Provision of Reactive Power 266
Christian Ziesemann, Robert Schmidt, Albert Moser

Women in Engineering – Role of Women in Renewable Energy 271
Anisha Chopra, Priyanshi Aggarwal, Alok Kumar, Somara Lakra, R. K. Porwal, S. R. Narasimhan

A Framework for Generating Attack Samples in Power Energy System Using VAEs 275
Tran L. T Le, David K. Y Yau, Justin Albrethsen

Evaluation of PV Output Prediction Errors Due to Snow Coverage on Unit Commitment Using a Time-Varying Mean Reversion Model 280
Takuto Komuro, Nobuyuki Yamaguchi, Yusuke Manabe, Hideaki Ohtake

Attack Detection for Distributed Photovoltaic Generation Systems Leveraging Cyber and Power Side Channel Data 285
Huaiyu Liu, Yuze Fu, Kaikai Pan, Wenyuan Xu, Chenggang Li, Chen Liu

Study on the Optimal Capacity Planning Method of Converter Stations for Sending-End Multi-terminal HVDC Transmission Grid 290
Hao Lin, Liang Liang, Haiqiong Yi

Demand Response Analytical Framework for Assessing Programme Applicability Across Countries 295
Katya D. O. Soegiharto, David C. H. Wallom

Determination of Fluctuated Threshold of Input Data in CNN-Based Solar Irradiance Prediction Method Using All-sky Image 300
Minori Kanenobu, Akiko Takahashi, Masakazu Ito

A Network-Aware Peer-to-Peer Energy Trading Framework with Dynamic Pricing Mechanism 305
Sachinkumar Suthar, Naran Pindoriya

Assessing Probabilistic Load Forecasting Accuracy Against Customer Privacy Constraints at a Low Aggregate Level 310
Ehsan Razavi, David Smith, Manickam Minakshi, Martina Calais

Enhancing Irradiance Prediction Using Short-Term Data: A Machine Learning Approach to Resilient Energy Management..... 315
Pratishtha Pandey

Effect of Considering Network Constraints in Energy or Reserve Market on Procurement Cost of Market Players..... 320
Keita Kato, Hiroumi Saitoh

Network-Agnostic Voltage-to-Power Sensitivities of a Real-Time Reduced Active Distribution Network..... 325
Manorath Prasad, Zakir Hussain Rather, Reza Razzaghi, Suryanarayana Doolla

GRU Based EV Charging Algorithm for Vehicle-To-Home Applications..... 330
Pratosh P. Patankar, Zakir Hussain Rather, Ariel Liebman, Suryanarayana Doolla

A Conceptual Insight into Achieving Interoperability Between Heterogeneous Blockchain Enabled Interconnected Smart Microgrids 335
Disha Lagadamane Dinesha, Balachandra Patil

Day-Ahead Demand Response Potential Forecasting Model Based on BILSTM for Load Aggregators 340
Yuntong Lv, Di Yang, Zhitao Wang, Bingfang Xu, Meiyi Li, Xinxin Ge, Fei Wang

Correction Method of Baseline Load Estimation Result Based on the Identification and Evaluation of the Rebound Effect..... 345
Lishan Ma, Chao Sun, Shengqiang Gao, Yuanxiao Ma, Xinxin Ge, Fei Wang

An Overview of Optimization Techniques for Operation and Planning of Energy Hub Under Uncertainty 350
Divya Sharma, Naran M. Pindoriya

Sizing of Battery Energy Storage System for Peak Reduction of Commercial Users Using Historical Data..... 355
Abhishek Joshi, Vikram Cherla, Pradeep Kumar Yemula

Optimized Scheduling of Ensemble Home Energy Resources for Effective Utilization Under Demand Response Program 360
Abhishek Tiwari, Souvik Bera, Naran M. Pindoriya

SoC Balancing Mechanism to Improve Active Power Sharing Among Multiple ESS Units in Low-Inertia Power Systems 365
Nikita Buchinskiy, Hiroumi Saitoh

An Incentive-Based Demand Response Scheme for Unbalanced Distribution System..... 370
Abhishek Tiwari, Bablesh K Jha, Naran M. Pindoriya

Power System Transient Stability Prediction Using Convolution Neural Network and Saliency Map..... 375
Heungseok Lee, Jongju Kim, June Ho Park

Bad-Data-Resilient Dynamic State Estimation for Power Systems with Partially Known Models 380
Milos Katanic, John Lygeros, Gabriela Hug

Impacts of the Reactive Power Control on the Small-Signal Stability of Grid Forming Inverters..... 385
Nabil Mohammed, Weihua Zhou, Behrooz Bahrani

Author Index