

# **2023 International Conference on Technology and Policy in Energy and Electric Power (ICT-PEP 2023)**

**Jakarta, Indonesia  
2-3 October 2023**



**IEEE Catalog Number: CFP23Y28-POD  
ISBN: 979-8-3503-6972-4**

**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:	CFP23Y28-POD
ISBN (Print-On-Demand):	979-8-3503-6972-4
ISBN (Online):	979-8-3503-6971-7

**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 Content

Message from the General Chair .....	iii
Welcome speech the Chair of IEEE Indonesian Section .....	iv
Message from the General Manager of PT. PLN (Persero) Research Institute .....	v
ICT-PEP 2023 Committee .....	vi
Program Information .....	vii

## Technical Paper

Paper ID	Title	Pages
1570917073	The Impact of Renewable Energy Interconnection on Losses and Power Quality in Distribution Network (Case Study: Kuala Distribution System)	1
	Rikardo Simanjuntak; Nathan Saputra Sitohang; Arif Andia Karca; Hans Siregar; Fahmy Albar	
1570918162	Navigating Power System Congestion: An In-Depth Review of Traditional and Artificial Intelligence-Driven Approaches	6
	Amir Hamza; Faiza Ahmad; Ayaz Ahmad; Sadiq Ahmad; Abdullah Shoukat	
1570922328	Role of Power Electronics in Renewable Energy Generation: Reviewing Energy Saving Applications, Solutions, and Insights	12
	Amir Hamza; Hamza Nisar; Faiza Ahmad	
1570923517	Partial Discharge Intensity Estimation on Hydrogen-Cooled Generator Using Fuzzy Logic Based Decision Tree Algorithm	18
	Nanda Redha Arsyah; Suwarno Suwarno; M. Arief Arief Auluddin; M Annas Albab Fauzi	
1570924477	Design of Solar DC Source for Triangle Tower Communication Link in Remote Areas	24
	Syafii Syafii; Thoriq K Agung; Hanalde Andre; Ridho Tullah Syahputra; Farah Azizah	
1570925002	Optimal Electricity Supply System Based on the Clean Energy Transition	29
	Conny K. Wachjoe; Hermagasantos Zein; Yanti Suprianti; Bella Eliana	
1570925052	Optimal Placement of DG and Minimization of Power Loss Using Naked Mole Rat Algorithm	35
	Pasala Gopi; Suresh Babu Palepu; Sarika D; Ch Naga sai Kalyan; Madhusudana Reddy Bolla; Meisam Mahdavi	
1570925305	Analysis of Electrical Power Measurement Towards an Error in Current Transformer Wiring	41
	Fajar Syahbakti Lukman; Hardika Eka Sapta Dharmawan; Kurnia Ramadhani; Arnawan Hasibuan	
1570925336	System Design of Insulator Inspection Software for HV Distribution Lines	47

Paper ID	Title	Pages
	Chinzorig Sunduijav; Tumurchudur Lkham; Batbayar Battseren; Uranchimeg Tudevdagva; Dashdavaa Bilegt; Wolfram Hardt	
1570925448	Optimal Supercapacitor Energy Storage System Sizing for Frequency Control in a Large-Scale Photovoltaic Integrated Grid	52
	Atik Jawad; Kazi Ishrak Ahmed; Ishtiak Mahmud; Nahid-Al- Masood	
1570925454	Lightning Protection Study on 1 MW Cirata Solar PV Power Plant	58
	Muhammad Thoriq Rizquloh; Hermagasantos Zein; Siti Saodah	
1570925507	Investigation of Carbon Capture Application in Existing 1000 MW Class Coal-Fired Power Plant for Retrofit Purpose: Heating Steam Source Tapping Point Analysis	64
	Alfian Muhammad Reza; Aga Batry Heksaprilla; Muhammad Royan Alfi Rosyidin; Muhammad Syofuan Karnadi; Maulana Rifaldi; Chairani Rachmatullah	
1570925515	Study of Ammonia Co-Firing Application in Existing Indonesia 600 MW Class Subcritical Coal-Fired Power Plant: Combustion Equipment Investigation	70
	Alfian Muhammad Reza; Andal Adhi Prakoso; Fuad Chariri; Ade Okta Yurwendra; Angga Septian Ardiyanto; Muhammad Faizal Lihawa	
1570925516	Design and Implementation of Advanced Metering Infrastructure for Induction Cooker in PLN ULP Manahan	76
	Muhammad Arief Wibowo; Suhono Suhono; Agung Siswoyo	
1570925577	Performance Investigation of Five Phase Outer Rotor Flux Reversal Machine at Different Rotor Pole Configurations	82
	Shoaib Ahmed; Muhammad Bilal Ali Ashraf; Rana Athar Mehmood; Haris Shahbaz; Surat Khan; Mehr Gul	
1570925588	Battery Monitoring System to Obtain State of Charge and State of Health on Electric Vehicles	88
	Ayu Nur Lestari; Safira Firdaus Mujiyanti; Nabiilah Aziizah Tjandra; Riski Mulyaning Mulyaning; Zalfaa Shaafia Kaltsum; Izef Aulia Kurniawan	
1570925621	Strategy for Optimizing Electricity Oversupply in Indonesia Through Captive Power Acquisition: Using Sustainable Business Model	93
	Apri Setiawan; Prahara Lukito Effendi	
1570925652	Design and Analysis of Contra-Rotating Permanent Magnet Vernier Machine	99
	Mehroz Fatima; Faisal Khan	
1570925663	Evaluation of Rotor Pole Impact on Electromagnetic Performance of Non-Overlapped Winding Dual Stator Wound Field Flux Switching Machine	105
	Wasiullah Khan; Naqash Mughal; Muhammad Shaheer Ahmad; Faisal Khan; Wasiq Ullah; Udochukwu Bola Akuru	
1570927037	Performance Comparison of Flux Switching Permanent Magnet Linear Machine with and Without Flux Gaps	109
	Saira Tariq; Faisal Khan; Niaz Muhammad; Basharat Ullah	
1570927815	Energy Management of Dual-Sources Electric Vehicles Using Adaptive Low-Pass Filter	115
	Hari Maghfiroh; Oyas Wahyunggoro; Adha Imam Cahyadi	
1570930655	Power System Simulator's Performance Comparison Using Load Flow and Short Circuit Analysis as Case Study	121

Paper ID	Title	Pages
	Nathanael Michael Tedjo Kurniawan; Roni Irnawan; Mokhammad Isnaeni Bambang Setyonegoro	
1570931053	Voltage-Mode Fuzzy Logic Controller for Enhancing Synchronous Buck Converter Operation Rizky Ajie Aprilianto; Rizki Mendung Ariefianto	127
1570931217	Capacity Loss Modeling of Li-Ion Battery Using Lightweight Neural Network Considering Equivalent Circuit Model Muhammad Dzaky Ashidqi; Adha Imam Cahyadi; Ahmad Ataka	133
1570931785	Small Signal Stability Analysis of DFIG IEC IIB Integrated into Small Interconnection Power System Binhot P Nababan; Ferdinan N T P Simanullang; Musa P Marbun; Fathin Saifur Rahman	139
1570932520	Analysis of Modified Conveyor Skirt Board Geometry and Their Effects on Dust Generation Prediction Andi Desi Sunarno; Gunawan Dwi Haryadi; Khoiri Rozi; Ferdiand Rosi Saprudin	145
1570932710	The Effect of Public Electric Vehicle Charging Station on the Harmonic and Electrifying Lifestyle Improvement in Bandung Hariadi Fitrianto; Martin Choirul Fatah; Iwa Garniwa Mulyana K.	150
1570932833	Optimal Sizing of PV and Diesel Generator for Remote Microgrids: A Case Study in PV Integration and Power Management in Sangihe Island Dhea Handayani; Erdhi Dwi Cahyo; Jonathan Fikar Lumingkewas; Darabean Aitana; Avian Lukman Setya Budi	156
1570932965	A Mixed-Integer Linear Programming-Based Power Allocation of Supercapacitor-Battery Energy Storage for Off-Grid Applications Niken Adriaty Basyarach; Vita Lystianingrum; Muhammad Fauzan Triyanto; I Made Yulistya Negara; Ardyono Priyadi	162
1570933252	Feasibility Study of Tidal Stream Power Plant for Semi-Submersible Oil Rig in Southeast Sangatta Area Afgha Izzam Tursina; Azriel Naufal Fadilah; Muhammad Erik Gunawan	168
1570933261	Performance Comparison and Experimental Analysis of Three-Phase Induction Motor with Aluminium and Copper Winding Aamir Khan; Ahsan Ayaz; Faisal Khan; Wasiq Ullah	174
1570933473	Impact of Battery Energy Storage System Penetration on UFLS Scheme in NTT Electrical System Fiqo Aulia Icksan; Hasna Satya Dini; Respati Adi Katmoyo	179
1570933696	Comparative Study of a Novel Symmetrical and Asymmetrical Interior Permanent Magnet Synchronous Machine for EVs Application Niaz Muhammad; Faisal Khan; Saira Tariq; Basharat Ullah; Muhammad Atif; Tahsin Ullah	185
1570933788	Failure Analysis of a Cracked Gas Compressor Paryanto Paryanto; Nur Cahyo; Sulardjaka Sulardjaka; Andriyan Cahyono; Belly Rakhmadhansyah	191
1570933905	A Machine Learning Based Frequency Response Prediction of Deloaded Photovoltaic System Under Variability Azazul Islam; Atik Jawad; S. M. Monzurul Hoque; Nahid-Al- Masood	195

Paper ID	Title	Pages
1570933945	Prediction of Frequency Response of Power Grid: An Ensemble Learning Based Approach	201
	Atik Jawad; S. M. Rhydh Arnab; Mohammad Rakin Uddin; Nahid-Al- Masood	
1570933997	Evaluating Indonesia's Solar Policy Implementation Using System Dynamics Approach	207
	Hendy Ginanjar Sasmito; Park Soo-jin	
1570934147	Carbon Reduction and Utilization for Levelized Electricity Generating Cost Optimization Through LNG Cold Utilization	213
	Naufal Muflih Ramadhon; Inaya Yuliandaru; Masri Mulyadi; Maulana Rifaldi	
1570934153	Review of Advanced Air-Based PV Cooling Technique	219
	Rudi Darussalam; Iwa Garniwa; Agus Risdiyanto; Ahmad Fudholi	
1570934195	Implementation of Inverse Power Function for Lifetime Estimation of HVDC Cable Under Stress Voltage, Space Charge and Thickness	225
	Muhammad Luthfiansyah Romadhoni; Muhammad Fadli Nasution; Muhammad Bondan Setiawan; Miftahul Fikri; Christiono R.; Iwa Garniwa; Nurhadi Nurhadi	
1570934205	Observing Generator Performance by Finite Element Analysis Considering Coil Numbers	229
	Muhammad Afnan Habibi; Mochamad Farhan Ali Irfani; Langlang Gumilar; Arya Kusumawardana; A. Aripriharta; Angger Baskoro	
1570935142	Implementation of FIR Digital Filters on FPGA Board for Real-Time Audio Processing	233
	Fahad Syed; Wasid Ali; Adarsh Kumar; Farhad Ilahi Bakhsh	
1570936731	Enhanced Grid Stability Operation with Plant-Level Control of Generic Inverter-Based Resources in an Embedded HVDC Link	238
	Umar Fitra Ramadhan; Minhan Yoon	
1570938351	Design and Implementation of a RCD Snubber Circuit on Full-Bridge DC-DC Converter	244
	Dhika Abiyoso Rahardianto; Waru Djurianto; Taufik Taufik; Rini Nur Hasanah	
1570938766	Zero Crossing Current Spike Elimination in Hybrid-Modulated Interleaved Full-Bridge Inverter	250
	Laskar Pamungkas; Huang-Jen Chiu; Chang-Tsai Tsai; Ta-Wei Huang; Yu-Chen Chang; Yu-Ping Wang	
1570938932	Comparison Between B30 Fuel and Crude Palm Oil for Diesel Power Plants at PLTD Merawang Bangka	256
	Diana Aristiawan Setyo Wibowo; Zico Alaia Akbar; Dhani Johar Damiri	
1570938939	Performance Enhancement of Small Wind Power Extraction Employing Self-Lift SEPIC Converter	261
	Rizki Mendung Ariefianto; Rini Nur Hasanah; Wijono Wijono; Mochammad Rusli; Rizky Ajie Aprilianto; Eduard Muljadi	
1570939076	Preliminary Study on Fabrication of Photoanode from CsPbBr <sub>3</sub> Nanocrystal for Glucose Fuel Cell	267
	Ayu S Tunjung; Dewi P Ningrum; Widyanto I Krisnanto; Taras G De Yonarosa; Mas Irfan Purbawanto H; Agung Purniawan; Tubagus N Rohmannudin; Azzah Dyah P	
1570939143	Optimization of Design Cable Routing in Onshore Wind Farms Using K-Means Clustering Considering Restricted Area	271
	Dimas Rif'an Maulana; Roni Irnawan; Mokhammad Isnaeni Bambang Setyonegoro	

Paper ID	Title	Pages
1570939236	The Role of PLN to Support Green Industries	276
	Andrew Cahyo; Mujammil Asdhiyoga Rahmanta; Siti Aisyah	
1570939367	Design and Implementation of Defense Schemes to Support Reactor Operations in the Ketapang Isolated System	282
	Mochamad Farid Mustofa; Arif Rahman Hakim; Andi Muh. Fadel Asrun	
1570939467	Profitability Analysis Among PV Installation Technologies from Technical and Policy Aspects in Indonesia	288
	Fajar Budi Suryawan; Yoon Yong-Beum; Park Soo-jin	
1570939480	Primary Energy Supply Chain Optimization: Delivery Time Analysis	293
	Ignatius Rendroyoko; Bagus Setiawan; Adelaido Sufit; Odi Sefriadi; Dody Baskoro; Rika Susanti	
1570939555	Exploring Renewable Energy Solutions for Indonesia's New Capital: A PVsyst Analysis for the Construction of a Floating PV System on Merdeka Reservoir Balikpapan	299
	Mirza Prasetya Kurniawan; Rizal B Wiguna; Dani Nugroho	
1570941304	Effect of Load Capacitance on Sympathetic Inrush Current	305
	Hana Abdull Halim; Nurul Fatin Nadhirah; Nurhakimah Mohd Mukhtar; Nur Huda Ramlan	
1570943955	Green Hydrogen Production from Geothermal Power Using Solid Oxide Electrolyzer Cell (SOEC) on Kamojang Field: Potential and Challenge	310
	Alfian Muhammad Reza; Muhammad Arif Susetyo; Perdana Noverda Pamurty; Renar Parama Aryoputro; Muhammad Firmansyah; Wismanto Setyadi	
1570944036	Design and Development of Battery Cell Protection System on LFP Battery Pack Using Bypass Techniques	316
	Chico Hermanu Brillianto Apribowo; Endah Retno Dyartanti; Salman Al Farisi; Hilwan Hafidzsyah	
1570947001	Multistate k-Out of N System Reliability for On-Grid PV System Using Universal Generating Function	322
	Ryandi Ryandi; Pradita Hadi; Nanang Hariyanto; Bambang Anggoro S. P.	