

CIREN 2020 Berlin Workshop

IET Conference Publications 767

Berlin, Germany
22 - 23 September 2020

ISBN: 979-8-3313-1250-3

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.

This work is licensed under a Creative Commons Attribution 3.0 International License.
License details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination, and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact the Institution of Engineering and Technology at the address below.

Institution of Engineering and Technology
P. O. Box 96
Stevenage, Hertfordshire
U.K. SG1 2SD

Phone: 01-441-438-767-328-328
Fax: 01-441-438-767-328-375

www.theiet.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Siemens Active Network Management in the Look-Ahead Mode for the Enera Region	1
<i>S. Henselmeyer, S. Weber, J. Saussenthaler</i>	
Optimal Planning of Energy Storage Systems in Active Distribution Networks Considering Multiple Operation Optimisation Measures	4
<i>P. Gao, H. Chen, X. Wu</i>	
Developing an Effective Secure and Flexible Power Grid	9
<i>D. Vornicu, L. Predescu, A. Mingotti, L. Peretto</i>	
Optimal Battery Sizing for a Distribution Network in Austria to Maximise Profits and Reliability	13
<i>D. Huo, M.V. Santos, D.M. Greenwood, N.S. Wade, M.P. Resch</i>	
Risk-Controlled Planning Methodology: Comparison Between Stochastic and Deterministic Approaches.....	17
<i>I. Roca, L.M. Coelho, J. Machado, J. Viais, L. Jorge, R. Prata</i>	
Community Multi-Vector Heat and Power Systems: A Use-Case Simulation Study	20
<i>S.R. Jones, E. Naghiyev, M. Gillott, R. Boukhanouf, G. Walker</i>	
Effect in the Aggregated Demand of Solar-Plus-Storage Prosumers in the Residential Sector.....	24
<i>J. Lopez-Lorente, X. Liu, D.J. Morrow</i>	
Derivation of Planning Concepts for Further Roll-Out of Devices for Intelligent Network Operation on the Medium-Voltage and Low-Voltage Levels	27
<i>D. Schacht, P. Niewerth, H. Vennegeerts, M. Planic, G. Brammer, N. Wehbring, J. Sprey, A. Moser, A. Montebaur, J.M. Salzmann, P. Thomas, J. Brantl</i>	
Energy Demand Model for Electric Load Forecast in Urban Distribution Networks	31
<i>J. Monscheidt, B. Gernsjaeger, A. Slupinski, X. Yan, S.A. Ali, P. Wintzek, M. Zdrallek</i>	
How Can Distribution Grids Provide Flexibility for Additional Demands? Approaches from an Urban Distribution Grid Operator	34
<i>B. Heimbach, D. Tischner, H. Luternauer, J. Russli-Kueh, I. Schlatter, D. Hearn, R. La Fauci</i>	
GOFLEX: Towards a New Integrated Solution for a Cost-Effective Use of Demand Response in Distribution Grids.....	38
<i>Y. Sidqi, P. Ferrez, D. Gabioud, P. Roduit</i>	
Control of Distributed Loads and Storage Units „Ÿ a Novel Approach to Provide Flexibility to the Grid and the Market.....	42
<i>A. Benzarti, W.H. Wellssow</i>	
Operating Principle and Reliability of Load Management Systems in Low-Voltage Networks.....	46
<i>K. Kamps, S.A. Ali, P. Wintzek, F. Mohrke, M. Zdrallek, F. Aschenbroich</i>	
Linear Three-Phase Power Flow Model for Autonomous Microgrid Systems.....	50
<i>Y. Vilaisarn, M. Abdelaziz, J. Cros</i>	
Better Assessment of Load Reduction by Sampling and Machine Learning.....	54
<i>J.B. Noel, O. Chaouy</i>	
Cellular Approach as a Principle in Integrated Energy System Planning and Operation	58
<i>B. Uhlemeyer, J. Jakob, M. Zdrallek, C. Baumann, W. Wellbow, J. Dickert, S.J. Rasti, G. Blumberg, A. Schinke-Nendza</i>	

Utilising Distributed Reactive Power to Increase Network Connection Capacity	62
<i>G. McCormick, D. Mills, M. Bitos, Y. Mavrocostanti</i>	
Flexible Control and Management Methods for Future Distribution Networks.....	66
<i>H. Laaksonen, C. Parthasarathy, H. Hafezi, M. Shafie-khah, H. Khajeh</i>	
Simulation of an Integrated Planning of Power and Gas Distribution Grids Considering Power-To-Gas and Gas-To-Power Units	70
<i>J. Jakob, B. Uhlemeyer, M. Koralewicz, J. Garzon-Real, M. Zdrallek, J. Ruf, W. Koppel, B. Bauhaus</i>	
Prediction of Power Flow Results in Time-Series-Based Planning with Artificial Neural Networks and Data Pre-Processing.....	74
<i>F. Schafer, J.H. Menke, M. Braun</i>	
Design and Operation Planning of Sector-Coupled Energy Systems Using the Flexibility of Smart DSM	78
<i>C. Wiezorek, S. Werner, C. Backe, M.B. Firvida, T. Voge, P. Conradi, K. Strunz</i>	
Future Electricity Demand and Flexibility Potential of Private Households	82
<i>P. Mann, A. Moser</i>	
Urban Medium-Voltage Distribution Network Planning Under a Complete Back-Up Regime	86
<i>V. Puvi, R.J. Millar, E. Saarijarvi, J. Anttila, J. Lepisto, M. Loukkalahti, K. Hayami, T. Arbelot, M. Klein, M. Lehtonen</i>	
Off-Grid Hybrid System for the Berlenga Island	90
<i>C. Pinto, L.T. Ferreira, T. Santiago, A. Ribeiro, N. Cativo</i>	
From Home Energy Management System Local Flexibility to Low-Voltage Predictive Grid Management	94
<i>D.F. Lopes, M. Simoes, G. Sampaio, D. Rua, P. Machado, R. Bessa, R. Andre, J. Moreira, C. Abreu, A. Madureira</i>	
Clustering Consumption Data – a Big Data Cloud-Oriented Approach	98
<i>V. Pereira, A. Aguas, H. Rosa, L. Jorge, R. Prata</i>	
Medium-Voltage Distribution Grid Planning Considering the Flexibility of Distributed Energy Storage.....	101
<i>S. Carvalho, N. Pires, R. Bernardo, B. Almeida, F.C. Branco, L. Carvalho, R. Ferreira, D. Castro, C. Gouveia</i>	
Fairness Indices for Residential Power Demand Management Contracts	105
<i>M. Vanin, H. Ergun, R. D'hulst, K. Vanthournout, D. Van Hertem</i>	
Planning LV Grids by Predicting Residual Loads of Households Via Methods of Machine Learning	109
<i>M. Rose, L. Lenz, T. Sowa, I. Hebbeln</i>	
Reliability-Based Planning of District Integrated Energy System Considering Distributed Energy Storage and Demand Response	113
<i>T. Long, Z. Bie, H. Xie</i>	
Short-Term Load Forecasting Scheme Based on Improved Deep Residual Network and LSTM.....	117
<i>Y. Tian, S. Yu, M. Wen, K. Zhang, Y. Chen</i>	
Quantification of Transmitted Energy and Power for System Services by Battery Electric Vehicles Based on Real Mobility and Charging Profiles	121
<i>M. Fischer, J. Elias, K. Bogenberger, S. Schramm</i>	

Synthetic Charging Profiles Development of Battery–electric Trucks for Probabilistic Grid Planning.....	124
<i>K. Walz, D. Contreras, K. Rudion</i>	
Smart Meter-Driven Estimation of PV Hosting Capacity	128
<i>A.T. Procopiou, M.Z. Liu, L.F. Ochoa, T. Langstaff, J. Harding</i>	
Planning a Flexible Distribution Network with Energy Storage Systems Considering the Uncertainty of Renewable Sources and Demand	132
<i>M. Jooshaki, S. Fattaheian-Dehkordi, M. Fotuhi-Firuzabad, M. Lehtonen</i>	
SMART Energy Communities: A Case Study for Greece	136
<i>N. Atzarakis, I. Kouveliotis-Lysikatos, F. Palaioagianis, A. Vasilakis, D. Tsekeris, N. Hatziargyriou</i>	
Integrated Monitoring System to Assess LV Flexibility Impact.....	140
<i>A.P. de la Morena, R. Santos, D. Lopes, L. Antunes, J.E. Sousa, Y. Ahmad, J. Mourao, J. Moreira, M. Barbaro, J. Oliveira, F. Cordeiro, B. Galhardo</i>	
Coordination Trial of Novel Distributed Energy Resources Management System to Provide Reactive Power Services to Address Transmission Constraints	143
<i>S. Davarzani, A.R. Ahmadi, T. Manandhar, R. Shaw, S. Georgiopoulos, I. Martinez, B. Stojkowska</i>	
Understanding the Network Impact of EV Growth: Long-Term Planning Approaches Developed in the Charge Project	147
<i>M.E. Collins, L. Kane, R. MacDonald, M. Bebbington, G. Murphy, S. Buckley</i>	
Interaction Between Local and Open Energy Markets – Guidelines for Local Market Design.....	151
<i>S. Annala, S. Honkapuro, S. Repo, O. Kilkki, J.M. Terras, A. Neto</i>	
Method to Describe and Rate the Ability to Provide Flexibility of Residual Power Providers in Electricity Grids with a High Share of Variable Renewable Energies	154
<i>V. Selleneit, T. Mast, U. Holzhammer</i>	
Investment Planning in Multi-Vector Energy Systems: Definition of Key Performance Indicators	158
<i>M. Hoffmann, S. Puranik, M. Juanpera, J.M. Martin-Rapun, H. Tuiskula, P. Blechinger</i>	
Optimal Management for Multifluid Island Microgrids.....	162
<i>S. Pietrasz, L. Bouchendouka, A. Lienes</i>	
Data-Driven Congestion Management for LV Distribution Networks	166
<i>A. Tomar, M. Babar, P.H. Nguyen</i>	
DSO and Flexible Power Contracts as Enablers of EV Smart Charging in Residential Collective Buildings	170
<i>E. Francisco, L. Ferreira, C. Silva, J. Braga</i>	
Flexibility from Multi-Vector Systems: Beyond Low-Voltage Network Modelling	174
<i>M. Deakin, S. Walker, P.C. Taylor</i>	
Improved Peak Load Estimation from Single and Multiple Consumer Categories.....	178
<i>K. Furst, P. Chen, I.Y.H. Gu, L. Tong</i>	
Approach to Assessing the Effective Integration of Solid-State Transformers in LV Networks	182
<i>K. Smith, D. Wang, R. Pena-Alzola, G.M. Burt, A. Kazerooni, M. Eves</i>	
Optimal Hybrid PV-Battery Residential System Management and Sizing Taking into Account Battery Thermal Behaviour and Ageing	186
<i>A. Michiorri, G. Lupaldi, D. Bertelli</i>	

Multi-Energy Biogas Production Plant Exploiting Electrical Market Services Provision.....	190
<i>E. Corsetti, A. Del Corno, J.M.P. Carpe, T.I. Pollanen, E.M. Gil, M.C. Garcia</i>	
Low-Voltage Network Topology Identification for Better Flexibility Planning – Portugal Experiment	194
<i>C. Debontride, T. Trouillon, R. Pellerej, C. Benoit, A.P. de la Morena, M. Barbaro, R.J. Santos</i>	
Optimal Distribution Grid Expansion Planning Under Consideration of Dynamic DG Curtailment	198
<i>M. Miller, K. Rudion, F. Fischer, H. Nagele</i>	
Methodology to Support the Flexibility Maximisation for Multi-Energy Systems to Provide Services to the Electrical Distribution System	202
<i>E. Corsetti, A. Del Corno, M. Riello</i>	
Distribution Optimal Power Flow	206
<i>A. O'Connell, J. Smith</i>	
Impact of Flexibility on Low-Voltage Networks' Hosting Capacity – Belgium Experimentation	209
<i>R. Pellerej, T. Trouilon, C. benoit, Q. Garnier, A. Versyp</i>	
Flexible Network Planning Process: Case Study.....	213
<i>R. Bryans, K. Singh, M. Plecas, M. Friese, M. Bebbington, W. Mantle</i>	
Multi-Objective Optimisation of Storage Devices in Distribution Networks.....	217
<i>G. Celli, F. Pilo, S. Ruggeri, G.G. Soma</i>	
Pragmatic Method for Assessing the Security of Supply in Future Smart Distribution Networks	221
<i>D.M. Greenwood, P. Djapic, I. Sarantakos, S. Giannelos, G. Strbac, A. Creighton</i>	
Resource Adequacy Methodologies in the European Framework – How to Take Flexibilities into Account in Future Modelling of Resource Adequacy?.....	225
<i>M. Petz, G. Achleitner, B. Mihic, R. Schurhuber</i>	
Flexibility of Grid Planning in Medium-Voltage Hybrid AC/DC Distribution Grids.....	229
<i>M. Dahms, T. Sowa, M. Rose</i>	
Impact of High Penetration Rates of Home Battery Energy Storage Systems on Low-Voltage Grid Planning Strategies	233
<i>I. Hebbeln, O. Pohl, M. Rose, M. Hubner</i>	
Review of Demand-Side BESS Management for Participation in Flexibility Markets	237
<i>P.O. Kela, H. Laaksonen, R. Zheng, C. Parthasarthy</i>	
Neighbourhood Load Profiles from Advanced Measurement Data.....	240
<i>A.J. Van Der Mei, R. Poulussen</i>	
Advances in OpenDSS Smart Inverter Modelling for Quasi-Static Time-Series Simulations	243
<i>P. Radatz, C.H.S. Rocha, J. Peppanen, M. Rylander</i>	
Integrating Energy Storage as a Non-Wires Alternative for Distribution Capacity.....	247
<i>J. Peppanen, J. Taylor, M. Bello, A. Maitra</i>	
Whole System Planning for Reactive Power Management	251
<i>S.C. de Guzman, R. Pampana, M. Bebbington</i>	
Improved Load Modelling for Emerging Distribution System Assessments.....	254
<i>P. Siratarnsophon, M. Hernandez, J. Peppanen, J. Deboever, M. Rylander, M.J. Reno</i>	
Quantifying the Participation of Electric Vehicle Fleets in Local Flexibility Tenders.....	258
<i>F.G. Venegas, M. Petit, Y. Perez</i>	

Active Power Quality Management in Smart Microgrids	262
<i>Y. Naderi, R. Sims, F. Coffele, L. Xu</i>	
Data-Driven EV Uptake Modelling.....	266
<i>N. Gray, R. Chalmers, C. Gilbert</i>	
Planning of an Efficient Power System with the Use of Modular Static Synchronous Series Compensation to Enable Flexible Operational Services.....	270
<i>R. Fenlon, M. Norton</i>	
Integrated MV-LV Network Modelling for DER Studies	274
<i>A.T. Procopiou, J. Jazaeri, K. Petrou, M. Liu, L.F. Ochoa, T. Langstaff, J. Harding, J. Theunissen</i>	
Peak-Shaving Potential of Residential Battery Energy Storage Systems Under Power-Based Tariff Pricing	278
<i>N. Nigmatulina, N. Belonogova, G. Mendes, S. Honkapuro</i>	
Autonomous Operation of Power Distribution Area Based on Edge Computing Framework	282
<i>Y. Yi, W. Dong, A. Li, J. Sun, X. Lian</i>	
Applying Reinforcement Learning to Maximise Photovoltaic Self-Consumption for Electric Vehicle Charging	285
<i>B.V. Mbuwir, E. Massip, K. Thoelen, G. Deconinck</i>	
Evaluation of LV Distribution Network with Active Network Management Under Fault Conditions	289
<i>A. Emhemed, F. McNicol, L. Veitch, P. Black, P. Swan, C. Bradley</i>	
Optimal Procedure for Remote-Controlled Switch Devices Siting in Distribution Systems Using Heuristic Algorithms	293
<i>A. Bosisio, A. Berizzi, A. Morotti, B. Greco, V. Girola, G. iannarelli</i>	
Challenges to Use Flexibility in Low-Voltage Networks – Results of a Pilot Project.....	297
<i>M. Hable, R. Knoll, T. Darda, H. Hanchen, M. Schmidt, M. Kreutziger, P. Schegner, J. Lassig</i>	
Robust Control Method to Improve Microgrid Frequency Stability in Islanded Operation	301
<i>Y. Guo, T. Gorlich, W. Gawlik</i>	
Dynamic Reactive Power Management Based on Forecasts and Chronological Power Flow	305
<i>R. Goncalves, T. Soares, M. Louro, L.A.F.M. Ferreira, P.M.S. Carvalho, F. Carvalho, J. Machado</i>	
Fallback Operations in the Event of a Smart Grid Communications Failure	309
<i>P.T. Lawton</i>	
Review of the Recent Blackouts and the Enlightenment.....	312
<i>Q. Zhao, X. Qi, M. Hua, J. Liu, H. Tian</i>	
Development of Portable Microgrids to Increase Flexibility in Grid Operations.....	315
<i>C. Vila, M. Martinez, F. Palacios, J. Anduaga, S. Garcia, E. Garcia</i>	
Flexibility and Corresponding Steering Technologies as Important Elements of the Energy Transition: Regulatory and Technical Solution Approaches.....	319
<i>O. Schaloske, S. Maeding</i>	
Spatial and Temporal Flexibility Assessment in Distribution Network.....	322
<i>S. Davidov, R. Gorisek, D. Krnjak, T. Knez</i>	
Study on DC Microgrid Operation in an Island.....	326
<i>H. Kim, Y. Kwon, Y. Cho, J. Cho, J. Kim</i>	

Innovative Integrated Operation Planning Tool for the Current and Future 2030+ European Power Grid.....	330
<i>M. Di Somma, R. Ciavarella, G. Graditi, A.M. Khavari, M. Kosmecki, C.N. Papadimitriou, M. Valenti</i>	
Coordination of the Islanding and Resynchronisation Process of Microgrids Through a Smart Meter Gateway Interface.....	334
<i>B. Matthias, M. Banka, R. Krzystof</i>	
Network Peak Load Reduction by Home Charge Management of Electric Vehicles	337
<i>M. Berende, N. Refa, P. Bokhoven, L. Gardien</i>	
Machine-Learning-Based Bayesian State Estimation in Electrical Energy Systems.....	341
<i>S. de Jongh, F. Muller, H. Li, B. Georgieva, M. Suriyah, T. Leibfried</i>	
Smart Decentralised Energy Management	345
<i>S. Werner, T. Walter, C. Wiezorek, C. Backe, M.B. Firvida, T. Voge, P. Conradi, S. Bose, E. Kremers</i>	
Event-Triggered D-PMU-Based Frequency Controller for Islanded Microgrids	349
<i>Y.R. Rodrigues, M. Abdelaziz</i>	
Flexible Interconnection Analysis with EPRI DER Integration Testbed	353
<i>A. Garg, M. Hernandez, M. Carney, B. Currie, A. Akhtar, D. Weisser</i>	
Coordinated Operation of Distributed Energy Resources to Enhance Local Flexibility	357
<i>A. Ulasenka, A. Gastalver-Rubio, L.D.R. Etayo, P. Cirujano-Ballesteros, A. Ortiz-Gil, D. Morales-Wagner, D. Senas-Sanvicente, J. Montoya, K. Heussen</i>	
Automatic Phase Switch Enables Grid-Compatible Charging at Decentral Charging Points.....	361
<i>T. Noske, S. Haase, O. Kalis</i>	
Consumers Modelling and Clustering for the Use of Flexibility to Mitigate Network Congestion	364
<i>J.M. Terras, C. Silva, Z. Vale, P. Faria</i>	
Grid Operation 4.0 – IOT Technology and Innovation Combined in a Low-Voltage Grid	368
<i>J. Sturmer, A.C. Schneider, S. Kuppers, E. Pawlowski, R. Schiwiek, D. Dickopf, A. Gaytandjiev</i>	
Blockchain-Based Self-Consumption Optimisation and Energy Trading in Renewable Energy Communities	371
<i>M. Stefan, P. Zehetbauer, S. Cejka, F. Zeilinger, G. Taljan</i>	
Semi-Decentralised Self-Healing to Improve Flexibility in a Medium-Voltage Underground Grid	375
<i>P.S. Alves, A. Blanquet, B.E. Santo, J. Basillo, R. Braga, J.M. Peniche</i>	
Field-Test Based Comparison of LTE and PLC Communication Technologies for Smart Grid Applications.....	378
<i>H. Fruh, K. Rudion, A. von Haken, B. Wasowicz, M. Gerber</i>	
Flexibility Potential to Reduce the Peak Load of Small- And Medium-Sized Enterprises.....	382
<i>G. Rouwhorst, R. Fonteijn, A. Brouwer, P. Nguyen, H. Slootweg</i>	
Robust Coordinated Voltage Control in Low-Voltage Networks Validated Through an Experimental Study – Collaboration of an On-Load Tap Changer and a Battery Energy Storage.....	386
<i>S. Martinmaki, S. Repo, K. Rauma, A. Spina, C. Rehtanz</i>	
Smart AMI Events as Key Data to Manage Flexibility on Low-Voltage Grids.....	389
<i>R.L. Mourao, D.F. Lopes, B. Coelho, L.R. Antunes, J.E. Sousa, T. Simoes</i>	

Laboratory- And Field-Test Validations of a Smart Distribution Grid System.....	392
<i>P. Steinbusch, M. Koch, K. Korotkiewicz, M. Zdrallek, R. Uhlig, M. Stiegler, T. Kornrumpf</i>	
Saturation Simulation of Mass EV Charging on Congested 230 V LV Networks	395
<i>S.R. Broderick</i>	
Field Testing of a Local and Automatic Control for Flexible Loads	399
<i>S. Uhrig, S. Schramm, S. Baumgartner, G. Kerber, S. Hartmann</i>	
Smart EV Charging in Office Buildings.....	403
<i>E. Koivuniemi, J. Lepisto, P. Heine, S. Takala, S. Repo</i>	
Low-Voltage Operation in Berlin	407
<i>J. Schunk, D. Gunther, A. Stacker, K. Schlabit, E. Weigt, H. Slomski</i>	
Flexible Coordination Strategy Against Uncertainties in the Local Energy Market.....	410
<i>S. Liu, H. Wang, Y. Xiao, Q. Qiu, Z. Bie, Y. He</i>	
Monitoring and Control of Charging Infrastructure for Electric Vehicles: A Solution Suitable for Retrofit	414
<i>M. Auer, M. Schrock, D. Mountouri, R. La Fauci</i>	
Smart Grid Events Aggregation Algorithms.....	418
<i>J.E. Sousa, B. Coelho, T.F. Simoes, D. Fonseca, D.F. Lopes, D. Paulino</i>	
Distribution Grid Reconfiguration and Optimisation for Flexible Renewable Source Integration	421
<i>J. Sa, D. Franco, R. Ferreira, R. Verissimo, D. Fonseca</i>	
Coordination of Centralised and Distributed Intelligence to Reduce Curtailment of Flexible Generators Using Active Network Management	424
<i>T. Manandhar, S. Davarzani, A.R. Ahmadi, T. Sokari-Briggs, D. Jeyakumar, J. Ford, S. Georgiopoulos</i>	
Technical and Economic Assessment of PV-Coupled Energy Storage Systems: A Case Study from Italy, Based on Field-Data	428
<i>S. Mocci, S. Ruggeri, N. Poize</i>	
Practical Implementation of the Management of Local Flexible Generation and Consumption Units Using a Quota-Based Grid Traffic Light Approach.....	432
<i>C. Exner, M.A. Frankenbach, A. von Haken, A. Hock, M. Konermann</i>	
UK Power Networks Launches Major Flexible Distributed Generation Rollout Program with Advanced ANM System	436
<i>O. Bertetti, A.R. Ahmadi, T. Manandhar, T. Sokari-Briggs, H. Walsh, S. Davarzani, S. Georgiopoulos, M. White</i>	
Temporary Emergency Power Supply Using Medium-Voltage Islanded Microgrids – a Modular Concept for Distribution System Operators	440
<i>D. Willenberg, T. Wippenbeck, N. Schulte, T. Schmidt, R. Bertram, P. Linnartz, S. Simon, S. Heck, T. Christ, D. Jonas</i>	
Assessment of EV Hosting Capacity in a Workplace Environment in Different Charging Strategies	444
<i>N. Belonogova, S. Honkapuro, J. Partanen, T. Simolin, A. Rautiainen, P. Heine, J. Lepisto</i>	
Mobile Energy with E.DIS (Moew.e) Pilot Project Within IElectrix	448
<i>R. Wagenitz, B. Heib, T. Beibner, H. Schuster</i>	
Communication Requirements for Future Secondary Substations to Enable DSO Functions.....	451
<i>K. Ghanem, I. Abdulhadi, A. Kazerooni, C. McGookin</i>	

Protection Assessment Method for Flexibility of Hybrid Power System Protection Improvement: Study Case Sumbawa Subsystem, Indonesia.....	455
<i>C.A.D. Wahyudi, M. Fajri, A.Y. Rosyad, R. Ganjavi</i>	
Interaction of Hybrid Energy Systems with the Power Grid on the Example of an Industrial Company	459
<i>M.A. Lagler, R. Schurhuber, R. Heimrath, T. Mach, M.J. Muller</i>	
Delivering Distribution System Flexibility Through Micro-Resilience	462
<i>M.J. Dolan, R. MacDonald A. Webster, I. Miller, M. Grisdale, I. McDonald, A. Krasnodebski, N. Jakeman, T. Lakin</i>	
FUSE – Using Artificial Intelligence in the Energy Grid of Tomorrow	466
<i>T. Vogege, C. Backe, M. Bande, P. Conradi, P. Hovila, K. Kauhaniemi, H. Kumar, T. Kyntaja, M. Rita-Kasari, M. Shafiq, S. Werner, C. Wiezorek</i>	
Multi-Objective Optimisation of the Operation Schedule of POWER Plants Using Artificial Intelligence	469
<i>J. Mast, S. Radle, J. Gerlach, O. Bringmann</i>	
Medium-Voltage Grid State Control as a Basis Towards a Holistic Automation in Smart Distribution Systems	473
<i>K. Korotkiewicz, P. Steinbusch, M. Modemann, F. Paulat, M. Zdrallek, S. Hetzel, U. Dietzler, J. Vormelker, U. Schluter</i>	
Distributed Generation Impact on the Portuguese Distribution Grid Regarding Power Quality	477
<i>M.A.G. Almeida, C.A. Marques, S.M.S. Morgado, N.A.C. Melo, B.M.A. Campos</i>	
Stochastic Modelling of the Correlation Between Transformer Loading and Distributed Energy Resources in LV Distribution Networks	480
<i>T.T. Mai, M. Salazar, N.A.N.M.M. Haque, P.H. Nguyen</i>	
Using Energy Storage to Stabilise Grids and Increase Revenues	484
<i>J. Glassmire, H. Bitaraf, S. Cherevatskiy, D. Cicio</i>	
Distribution Feeder-Level Multi-Temporal Coordination of Electric Vehicle Charging Flexibilities Considering Rebound Impact and Vehicle Owner Preferences	487
<i>M.A. Zehir, B. Hayes</i>	
Designing a Laboratory Setup for Experimenting with Smart Metering for Smart Grid Applications: Technical Challenges.....	490
<i>A. Hamdan, F. Cadoux, C. Chauvenet</i>	
Islanding Tests in Medium-Voltage Distribution Systems with Synchronous and Non-Synchronous Generation	493
<i>C. Utrilla, L. Sigrist, L. Rouco, A. Barroso, F.J. Ballesteros, A. Santamaria</i>	
General Load Management System for the Low-Voltage Grid – Motivation, Concept, Basics	497
<i>M. Holt, J. Claus, M. Kosch, G. Schulz, M. Greve, C. Wagner, D. Hilbrich, J. Maasmann, C. Rehtanz</i>	
Modelling of Low-Voltage Grids with High PV Share and Q(U)-Control	501
<i>D.L. Schultis, S. Petrusic, A. Ilo</i>	
Multi-Agent Based Strategy for Controlled Islanding and System Restoration Employing Dispersed Generation	505
<i>M. Banka, D. Contreras, K. Rudion</i>	
Modelling of Uncertainty for Smart Grid Congestion Management	509
<i>P. Pfeifer, J. Tran, S. Krahl, A. Moser</i>	

Flexibility Provision by Distributed Prosumers in Wholesale Electricity Market.....	513
<i>M. Khoshjahan, M. Soleimani, M. Kezunovic</i>	
Development of Data Extraction Method Based on Clustering Method and CVI.....	517
<i>N. Takahashi</i>	
Monitoring Concept Suitable for Utilising Flexibilities in the Low-Voltage Distribution Grid: Learning from Implementation in Greencity Zurich	521
<i>L. Baumgartner, T. Feizi, D. Mountouri, C. Kohler, M. von Euv</i>	
Implementation of Energy Storage Systems in the Azores Islands as a Flexibility Tool to Increase Renewable Penetration	525
<i>D.C. Silva, J. Deruyter, C. Zech, R. Murugesan, L. Witmer</i>	
Use Cases in Sector Coupling as Part of the LINK-Based Holistic Architecture to Increase the Grid Flexibility	529
<i>A. Ilo</i>	
Deep Reinforcement Learning for Simulating the Strategic Bidding Behaviour of Distributed Flexibilities in Smart Markets	533
<i>J. Tran, P. Pfeifer, K. Berch, S. krah, A. Moser</i>	
Behaviour of the Graciosa Microgrid During Medium-Voltage Short Circuit Transient Events.....	537
<i>D.C. Silva, J. Deruyter, C. Zech, R. Murugesan, F. Goncalves, J. Aleixo, D. Luis, J. Silva, L. Witmer</i>	
DER Reactive Services and Distribution Network Losses	541
<i>D. Pudjianto, P. Djapic, G. Strbac, E.T. van Schalkwyk, B. Stojkovska</i>	
Implicit Flexibility: Apply Smart Dynamic Pricing Using Machine Learning for Different Needs	545
<i>G. Leclercq, S. Ulaganathan, G. Cambier, D. Halkin, P. Tordeur, J. Maricq</i>	
Transactive-Based Control Algorithm for Real-Time Energy Imbalance Minimisation in Microgrids.....	549
<i>S. Fattaheian-Dehkordi, M. Jooshaki, A. Abbaspour, M. Fotuhi-Firuzabad, M. Lehtonen</i>	
Day-Ahead Generation Planning and Power Reserve Allocation with a Flexible Storage Strategy.....	553
<i>X. Wen, D. Abbes, B. Francois</i>	
Value of Derms for Flexible Interconnection of Solar Photovoltaics	557
<i>J. Peppanen, J. Deboever, S. Coley, A. Renjit</i>	
Data-Driven Analysis of Distribution Cable Operating Temperature Profiles with LEONiQ Intelligent Cable Technology.....	561
<i>A. Ulbig, N. Stocker, M.G. Vaya, P. Heint, N. Beckhaus, S. Link, D. Toprak, A. Saliji, A. Sutter, B. Kaltenrieder</i>	
Emergency Island Operation of a Medium-Voltage Utility Grid with a Large Battery	565
<i>S. Rummeny, E. Waffenschmidt, F. Guenther, F. Klenner, P.R. Stankat</i>	
Battery Energy Storage System in the Fossil Fuel Heat and Power Plant – Highly Advanced Solution Enabling Market Entry with Utmost Flexibility and Emissions Reduction	569
<i>M. Kloubec, M. Panac, M. Jurik, J. Havlik</i>	
Assessing the Viability and Requirements of Black Start from DER	572
<i>C. Foote, D. Auty, P. Chandler, N. Miller, J. Carter, S. Corbett, C. Salter</i>	
Day-Ahead Economic Dispatch for Integrated Multi-Energy Microgrid Considering Distributed Agents.....	576
<i>Y. Kou, Z. Bie, J. Jiang, X. Wang</i>	

Hardware Implementation of an Optimal Power Flow Algorithm in a Distribution Network with Decentralised Measurements	580
<i>R. Palaniappan, O. Molodchyk, C. Rehtanz</i>	
Secure Standards-Based Reference Architecture for Flexibility Activation and Democratisation	584
<i>H. Keko, P. Hasse, E. Gabandon, S. Sucic, K. Isakovic, J. Cipriano</i>	
Aggregated Forecasting of the Load Control Responses Using a Hybrid Model that Combines a Physically Based Model with Machine Learning	588
<i>P. Koponen, T. Salmi, C. Evens, S. Takala, A. Hyttinen, C. Brester, M. Kolehmainen, H. Niska</i>	
Innovative Solutions to Enable Flexibility and Retail Markets in Distribution Grids: The Platone Approach	592
<i>I. Losa, A. Monti, V. Croce, E. De Luca, D. Stratogiannis, B. Petters</i>	

Author Index