

36th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS 2023)

Las Palmas de Gran Canaria, Spain
25-30 June 2023

Print ISBN: 978-1-7138-7492-8
eISBN: 978-1-7138-7481-2

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© (2023) by ECOS 2023
All rights reserved.

Printed with permission by Curran Associates, Inc. (2023)

For permission requests, please contact ECOS 2023:

Phone: (0034) 928-27-30-27

info@ecos2023.com

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

SPECIAL SESSION: THE FUTURE OF THERMOECONOMICS

On the Future of Exergy-Based Methods	1
<i>George Tsatsaronis</i>	
The Future of Thermoconomics After the School of Zaragoza	7
<i>César Torres, Antonio Valero Capilla, Alicia Valero Delgado, César Torres Cuadra</i>	
A Contribution to the Discussion on the Future of Thermoconomics	22
<i>Christos Frangopoulos, George Dimopoulos</i>	
The Exergy Footprint and the Resource Cost of Externalities.....	34
<i>Enrico Sciubba</i>	
From Thermoconomics to Environomics and Beyond	42
<i>Daniel Favrat</i>	
The Future of Thermoconomics: From Industrial Cost Minimization Toward Cumulative Resources Accounting and Sustainability Assessment	48
<i>Mauro Reini, Melchiorre Casisi</i>	

A. BASIC AND APPLIED THERMODYNAMICS

Internal Cooling of a Gas Turbine Blade Using Ranque-Hilsch Vortex Flow	58
<i>Asfaw Beyene, Daisy Galeana, Ashenafi Abebe</i>	
Liquefaction of Natural Gas in Offshore Installations: Effects of Irreversibilities and Composition of Natural Gas	68
<i>Waldyr Luiz Ribeiro Gallo, Rafael Dias Assunção</i>	
A Comparative Study of Thermophysical Properties of Amine Aqueous Solutions for CO ₂ Mitigation	80
<i>M. Carmen Martín, Eduardo I. Concepción, Alejandro Moreau, José J. Segovia, Yisel Pérez, Juan D. Arroyave</i>	
Trilateral Flash Cycle for Efficient Low-Temperature Solar Heat Harvesting - A Case Study	90
<i>Anastasios Skiadopoulos, Christina Antonopoulou, Konstantinos Atsonios, Panagiotis Grammelis, Apostolos Gkoutas, Panteleimon Bakalis, George Kosmadakis, Dimitris Manolakos</i>	
Hybrid Thermochemical Cycle for Cold and Electricity Cogeneration: Experimental Analysis of the Process Behavior and Expander-Reactor Coupling.....	102
<i>Hasan Ghazale, Nathalie Mazet, Pierre Neveu, Maxime Perier-Muzet</i>	
New Approach for a General Expression of Effectiveness Applied to All Conversion Technologies.....	114
<i>Malick Kane, Daniel Favrat</i>	
From the Fuel Heating Value to the Fuel Exergy Value in Advanced Energy Systems	126
<i>Daniel Favrat, Malick Kane</i>	

Finite Dimension Thermodynamics for Optimizing Power Plants Including Heat Storage Device	136
<i>Pierre Neveu, Baptiste Rebouillat, Quentin Falcoz</i>	

B. EXERGY-BASED ANALYSIS: APPLICATIONS AND TEACHING IN ACADEMIA

Exergoeconomic Analysis of a System for Liquefaction and Purification of Captured CO ₂	148
<i>Rikke Pedersen</i>	
Advanced Exergy Analysis of the Flash Ironmaking Process	160
<i>Jannik Neumann, Frank Dammel, Peter Stephan</i>	
Thermodynamic Assessment of Latin American Cities Applying Exergetic Efficiency: Effects of Information Availability on Efficiency Evaluation.....	172
<i>Ricardo Hartmann, Luis Evelio Garcia-Acevedo, Amir Roberto De Toni</i>	
Exergoeconomic Assessment of Green Hydrogen Production Via High Temperature Electrolysis Powered by Solar and Wind Energy	183
<i>Diego Izidoro, Silvio De Oliveira Junior</i>	
Free and Open-Source Teaching: Understanding Exergy Using Thermal Engineering Systems in Python (TESPy).....	195
<i>Mathias Hofmann, Francesco Witte, Malte Fritz, Jonas Freißmann, Ilja Tuschy, George Tsatsaronis</i>	
Thermoeconomic Cost Allocation Approaches in a Simultaneous Heating and Cooling Heat Pump System.	210
<i>Rodrigo Guedes Dos Santos, Miguel Ángel Lozano, Luis María Serra, Atílio Barbosa Lourenço, José Joaquim C. S. Santos</i>	
Exergetic Analysis of the nCO ₂ PP Cycle with Particular Reference to the Exergy Destruction of Sewage Sludge Due to Gasification	222
<i>Kamil Stasiak, Ivar Ståle Ertesvåg, Pawel Ziólkowski, Dariusz Mikielewicz</i>	
Teaching Exergy to Engineering Students in View of the Energy Transition.....	233
<i>Lydia Stougie, Brendon De Raad, Hedzer Van Der Kooi, Gijsbert Korevaar</i>	
Clear Paths to Teach Exergy	245
<i>Daniel Favrat, Malick Kane</i>	
Exergy and Exergy Cost Analysis of Biochemical Energy Conversion Process: Application to the Metabolic Model of Living Cells	257
<i>Assal Selma, Mauro Reini, Francesca Malfatti, Michele Giani</i>	
TaesLab: An Advanced Software Tool for Circular Thermoeconomics	266
<i>César Torres Cuadra, Antonio Valero Capilla, Alicia Valero Delgado</i>	

C. HEAT AND MASS TRANSFER.

Predictive Models for the “Optimal” Radius Ratios in Natural Bi- And Trifurcated Vessels: Beyond the Hess-Murray Law	278
<i>Enrico Sciubba</i>	
Exergy Cost Analysis of Bifurcated Circular Vessels with Permeable Walls: Beyond the Hess-Murray Law	290
<i>Enrico Sciubba</i>	

Application Feasibility of Low Temperature Cooling Tower for High-Temperature Buildings to Daytime Ventilation.....	304
<i>Ana Tejero-González, Manuel Andrés-Chicote, Eloy Velasco-Gómez, Sampath Suranjan Salins</i>	
Influence of Desiccant Concentration and Temperature on Moisture Absorption Using a Multistage Dehumidifier	316
<i>Ana Tejero-González, Shiva Kumar, Sampath Suranjan Salins, S. V. Kota Reddy</i>	
Solar Volumetric Receiver Coupled to a Parabolic Dish: Heat Transfer and Thermal Efficiency Analysis.....	324
<i>Judit García Ferrero, Rosa Pilar Merchán, María Jesús Santos, Alejandro Medina, Antonio Calvo-Hernández, Paulo Canhoto, Andrea Gistri</i>	
Direct Vaporization ORC-Evaporator Heat Transfer Model for Thermal Degradation Risk Assessment.....	336
<i>João Silva Pereira, José Baranda Ribeiro</i>	
Modelling and Scaling Laws of Cryogenic Tank's Thermal Response to Sloshing	345
<i>Samuel Ahizi, Pedro Afonso Marques, Miguel Alfonso Mendez</i>	
Heat Transfer of the Multicolor-Laser-Sources-Irradiated Nanoparticles in Reference to Thermal Processes	356
<i>Piotr Radomski, Federica Zaccagnini, Pawel Ziolkowski, Francesca Petronella, Luciano De Sio, Dariusz Mikielewicz</i>	
Analysis of First-Order Model for Thermistors in Compressible Flows Temperature Measurement.....	368
<i>Jorge A. Valencia Santana, Carlos Mendieta, Alejandro Ramos, Vicente Henríquez</i>	
An IR-Based Methodology for Indirect Measurement of Average Inner Temperatures	380
<i>Elisa Carvajal-Trujillo, Francisco Jiménez Espadafor Aguilar, Ricardo Chacartegui-Ramírez</i>	
Application of Feed Forward Neural Networks for Modeling of Heat Transfer Coefficient During Flow Condensation for Low and High Values of Saturation Temperature	391
<i>Stanislaw Gluch, Tacjana Niksa-Rynkiewicz, Dariusz Mikielewicz, Piotr Stomma</i>	
Flow Maps and Flow Patterns of R1233zd(E) in a Circular Minichannel at Low, Medium and High Values of Saturation Pressure	402
<i>Stanislaw Gluch, Michal Pysz, Dariusz Mikielewicz</i>	

D. COMPUTATIONAL THERMO-FLUID DYNAMICS (CFD).

Performance Characterization of the Proton Exchange Membrane Fuel Cell (PEMFC) Using the Lattice Boltzmann Modeling (LBM).....	414
<i>Hossein Pourrahmani, Milad Hosseini, Majid Siavashi, Hamza Moussaoui, Isabel Vazquez-Fernandez, Mardit Matian, Jan Van Herle</i>	
A Machine Learning-Based Calibration of a 1D Ejector Model from CFD.....	424
<i>Jan Van Den Berghe, Jagadish Babu Vemula, Yann Bartosiewicz, Miguel Alfonso Mendez</i>	
Analysis of Cyclone Separator Solutions Depending on SEC Outlet Conditions in nCO ₂ PP	436
<i>Milad Amiri, Pawel Ziolkowski, Kamil Stasiak, Dariusz Mikielewicz</i>	
An Industrial-Scale Cement Rotary Kiln CFD Model to Characterise Alternative Fuel Combustion Profiles	448
<i>Antonio Alcaide Moreno, Miguel Ángel Castán-Lascorz, Valter Tavares</i>	

Heat and Mass Transfer Analysis Within a Disc Shaped Fluidized Sorption Reactor	460
<i>Marcin Sosnowski, Jaroslaw Krzywanski, Karolina Grabowska, Anna Zylka, Anna Kulakowska, Dorian Skrobek, Marcin Dyner, Waqar Muhammad Ashraf, Radomir Šćurek</i>	
Numerical Multiphase Assessment of Geometric Key Parameters in Venturi-Type Reactor for Process Intensification.....	470
<i>Nicola Andreini, Guglielmo Vaccaro, Luca Socci, Adriano Milazzo</i>	
Numerical Investigation of Performance of a Disc Shaped Branched Heat Exchanger	482
<i>Kenan Kaya, Cihan Sezer, Mahdi Tabatabaei Malazi, Enrico Sciubba, Roberto Capata, Hasan Alpay Heperkan</i>	
CFD-Driven Optimization of a Venturi Tube for Wastewater Treatment Applications	492
<i>Alberto Benato, Francesco De Vanna, Matteo Ballan, Anna Stoppato</i>	
Contribution of Geometric Features on the Aeroacoustic Behaviour of a Slot Diffuser	500
<i>Philipp Ostmann, Lisa Krüger, Martin Kremer, Dirk Müller</i>	
Optimization of a Horizontal Entrained Flow Plasma Gasification Test Rig Through CFD-Simulation	512
<i>Sebastian Bastek, Sebastian Wilhelm, Mariam Fahmy, Sebastian Fendt, Hartmut Spliethoff</i>	
Assessment of Turbulent Parameters Modification to Model Roughness in the Flow Between Rotating Disks of Tesla Turbine	524
<i>Mohammadsadegh Pahlavanzadeh, Krzysztof Rusin, Włodzimierz Wróblewski</i>	
Urban Wind Potential Analysis: Case Study of Wind Turbines Integrated into a Building Using On-Site Measurements and CFD Modelling.....	534
<i>Alexander Vallejo, Idalberto Herrera, Juan Castellanos, Carlos Pereyra, Edwin Garabitos</i>	
Numerical Simulation on Thermal Management of Concentrating Photovoltaic-Thermal Module with Confined Jet Impingement with Ag-ZnO Hybrid Nanofluids	547
<i>Sandesh Surendra Chougule, Abhishek Gupta, Sandip Kumar Saha</i>	
Improvement and Optimization of the Convective Heat Transfer in the Polymer Pipes with Internal Surface Modifications	556
<i>Piotr Lapka, Juliusz Wachnicki</i>	
Preliminary Design Guidelines for a Vortex-Based Energy Harvester for Water Flows	566
<i>Alberto Benato, Francesco De Vanna, Giovanna Cavazzini</i>	
<u>E. POWER GENERATION AND COMBINED HEAT AND POWER (CHP) PLANTS.</u>	
ORC Design Optimization Method for Offshore Applications in Part Load Conditions	578
<i>Rafael Barbosa, Jurandir Yanagihara</i>	
Exergoeconomic Analysis of a Solar Powered ORC Using Zeotropic Mixtures for Combined Heat & Power Generation.....	589
<i>Christian Wolf, Torben Ommen, Erasmus Rothuizen</i>	
Integration of Solar Field into a Combined Cycle Power Plant for Fuel Saving in Insular Subtropical Climates	601
<i>Andrés Meana-Fernández, Adham Mohamed Abdelhalim, Ines Suarez-Ramon</i>	

Experimental Investigation of a Solid Oxide Fuel Cell (SOFC) Used in Residential Cogeneration Applications.....	613
<i>Nicolas Paulus, Lemort Vincent</i>	
Energy Analysis of a Hybrid Top/Bottoming ORC Based CHP Configuration for Residential Applications.....	625
<i>João Silva Pereira, José Baranda Ribeiro</i>	
Energy System Optimization Towards a Fossil-Free Power Plant Portfolio	635
<i>Duk Yong Kwon, Mathias Hofmann</i>	
Analytical Study of the Waste Heat for Energy Use in a Hygroscopic Cycle with High Lithium Bromide Concentration	646
<i>Roberto Martínez-Pérez, Andrés Meana-Fernández, Juan Manuel González-Caballín, Alessia Manfredi, Francisco Javier Rubio-Serrano, Antonio José Gutiérrez-Trashorras</i>	
Dynamic Modelling of ORC System for Vessel Waste Heat Recovery.....	658
<i>Konstantinos Braimakis, George Verykokkos, Efstratios Varvagiannis, Sotirios Karellas</i>	
Analysis of an Electrical Energy Production System from Solar Energy Using a Microscale CSP and ORC.....	670
<i>Márcio Santos, Bernardo Almeida, Jorge André, Ricardo Mendes, José Ribeiro</i>	
First Experimental Results of a New Free Liquid Piston Ericsson Engine.....	682
<i>Pascal Stouffs, Ryma Chouder, Azzedine Benabdesselam, Max Ndamé Nangué</i>	
Energy, Exergy, Exergoeconomic, and Exergoenvironmental Study of an Innovative Solar-Wind-Biomass Driven Polygeneration System for Power, Heat and Ammonia Production.....	693
<i>Ana Maria Blanco Marigorta, Mohammad Hassan Khoshgoftar Manesh, Soheil Davadgaran, Seyed Alireza Mousavi Rabeti</i>	
Thermodynamic, and Economic Performance of Novel ORC Designs Powered by Low-Grade Waste Heat.....	703
<i>Konstantinos Atsonios, Panagiotis Lykas, Christina Antonopoulou, Apostolos Gkoutas, Grigorios Itskos, Nikolaos Nikolopoulos, Panagiotis Grammelis, Dimitrios Manolakos, Pantelis Bakalis</i>	

E. REFRIGERATION AND HEAT PUMPS.

Thermodynamic Analysis of a High-Temperature Heat Pump Using Low GWP Natural Working Fluids for Upgrading District Heating to Process Heating	715
<i>Zhenyu Yang, Mohsen Sadeghi, Tage Petersen, Benjamin Zühlsdorf, Kim Stenholdt Madsen, Ahmad Arabkoohsar</i>	
How to Choose the Best Refrigerant in Heat Pumps from an Ecologic Perspective? Analyzing the Influence of the Evaluation Method	725
<i>Christoph Höges, Lennard Wissing, Christian Vering, Dirk Müller</i>	
Thermodynamic Investigation and Design of a Multi-Generation ORC-Ejector Cooling Cycle Heat Pump for Vessel Waste Heat Recovery.....	738
<i>Konstantinos Braimakis, Christos Xynos, Sotirios Karellas</i>	
Review of Business Models for Industrial Heat Pumps	749
<i>Cordin Arpagaus, Paranjape Sidharth, Nertinger Stefan, Tietz Rigo, Bertsch Stefan</i>	

Data-Driven Modelling of Supermarket Refrigeration Systems for Model Predictive Control Applications.....	761
<i>Max Bird, Salvador Acha, Emilio Escriva, Nilay Shah</i>	
Multi-Objective Optimization of a Solar-Assisted Ground-Source CO ₂ Heat Pump System for Space and Water Heating Using the Taguchi Method and Utility Concept	769
<i>Thor Alexis Sazon, Qian Zhang, Homam Nikpey</i>	
Experimental Setup Desing for Multi-Purpose Ranque-Hilsch Vortex Tube Investigation.....	781
<i>Wojciech Kostowski, Pawel Bargiel, Marcel Barzantny, Daniel Adamecki, Michal Majchrzyk, Barbara Mendecka, Erwin Maciak</i>	
Heat Pump Systems with Photovoltaics: Influence of the Control Strategy on the Optimal Design.....	792
<i>Fabian Wüllhorst, Jonas Reuter-Schniete, Laura Maier, Dominik Hering, Dirk Müller</i>	
Investigations on a Heat Pump Using Two-Phase Refrigerant Compressions.....	804
<i>Nicolas Leclercq, Javier Vega, Vincent Lemort</i>	
Fault Detection and Diagnosis by Machine Learning Methods in Air-To-Water Heat Pumps: Evaluation of Evaporator Fouling	815
<i>Sebastian Borges, Lasse Jöhnk, Tim Klebig, Christian Vering, Dirk Müller</i>	
The Impact of Controller Settings in Heat Pumps: Numerical Findings and Experimental Verification	827
<i>Stephan Göbel, Waiz Kevin, Vering Christian, Müller Dirk</i>	
Transient Analysis and Control of a Brayton Heat Pump During Start-Up.....	839
<i>Lorenzo Ferrari, Matteo Pettinari, Guido Francesco Frate, A. Phong Tran, Johannes Oehler, Panagiotis Stathopoulos</i>	
Exergy-Based Sizing of a R290 Air-To-Water Reversible Heat Pump for Space Heating and Cooling Purposes.....	851
<i>Volodymyr Voloschuk, Paride Gullo, Oleksandr Stepanets, Eugene Nikiforovich</i>	
The General Exergy Method of Heating/Cooling Technology Design for Optimization	863
<i>Malick Kane, Daniel Favrat</i>	
Efficient Integration of Advanced Absorption Heat Pumps and Chillers in District Heating and Cooling Networks.....	875
<i>Joan Carles Bruno, Addarda Usman</i>	
Identifying Techno-Economic Improvements for a Steam Generating Heat Pump with Exergy-Based Costs Minimization.....	884
<i>Brendon De Raad, Marit Van Lieshout, Lydia Stougie, Andrea Ramirez</i>	
A High-Fidelity Simulation Model for the Precise Characterization of a Solar Air-Cooled Ammonia-Water Absorption Chiller at Part Load Operation	896
<i>Maria Esther Palacios Lorenzo, Jose Daniel Marcos Del Cano</i>	

G. FUELS, COMBUSTION & GASIFICATION. FUEL CELLS. HYDROGEN USE IN ENERGY SYSTEMS.

Alkaline Electrolysis for Green Hydrogen Production: Techno-Economic Analysis of Temperature Influence and Control.....	908
<i>Lingkang Jin, Rafael Nogueira Nakashima, Henrik Lund Frandsen, Gabriele Comodi</i>	

Developing a Novel and Integrated Datacenter Concept Design Based on Hydrogen Production	920
<i>Ali Khosravi, Mohammad Malekan</i>	
Hydrogen and Fuel Cell Research Community at UPM: A Map of Infrastructures for the Challenge of Developing the Whole Value Chain of the Hydrogen Economy.	931
<i>Alberto Abánades Velasco, Teresa J. Leo, Marcelo Fabián Ortega, Enrique Alcalá, Isabel Carrillo</i>	
A Numerical Analysis of Transport Phenomena in a Banded Solid Oxide Fuel Cell Stack	938
<i>Karol Sreniawski, Marcin Mozdierz, Grzegorz Brus, Janusz S. Szmyd</i>	
Partial-Load and Dynamic Operation of Methane Synthesis Reactors Using Sorption-Enhanced Catalysis	955
<i>Andrea Barbaresi, Florian Kiefer, Mirko Morini, Panayotis Dimopoulos Eggenschwiler, Agostino Gambarotta</i>	
Hydrothermal Carbonization (HTC) Pellets Quality Assessment: Combustion Kinetics, Efficiency and Emissions.....	965
<i>Yaniel Garcia Lovella, Abhishek Goel, Louis Garin, Julien Blondeau, Svend Bram</i>	
Application of Genetic Algorithms to the Design and Dimensioning of Hybrid Power Plants Fueled by Alternative Fuels.....	977
<i>Álvaro Benet, Antonio Villalba-Herreros, Óscar Santiago, Teresa J. Leo</i>	
Energy System Analysis of the Power Sector Flexibility Via Hydrogen Utilization.....	987
<i>Andreas Hanel, Marcel Dossow, Rasmus Schamper, Sebastian Fendt, Hartmut Spliethoff</i>	
Development of a Numerical Optimization Model for Sizing Hydrogen Refuelling Stations: Application to a Case Study	999
<i>Ana Cristina Ferreira, José Paulo Ferreira, Senhorinha F. Teixeira, Luís Barreiros Martins, José C. F. Teixeira</i>	
GreenH2CM. Fuel Cell-Based Hybrid Powertrain Research and Testing Laboratory for Marine and Aeronautical Environments	1011
<i>Teresa J. Leo, Antonio Villalba-Herreros, Rafael D'Amore-Domenech, Vladimir L. Meca, David Gómez-García, Emilio Navarro</i>	
3D CFD Simulation of Water Droplet Dynamics on a Fuel Cell Gas Diffusion Layer by Considering a Realistic Woven Structure	1015
<i>Simona Merola, Christian Antetomaso, Adrian Irimescu, Bianca Maria Vaglieco, Simona Di Micco, Elio Jannelli</i>	
Experimental Model of a Hydrogen Fuel Cell Using Graphene Pads as Heat Spreaders.....	1027
<i>Aitor Fernández-Jiménez, Álvaro García-Martínez, Eduardo Álvarez-álvarez, Eduardo Blanco-Marigorta, María José Suárez-López</i>	
Anode Flow Field Design Effect on Direct Methanol Fuel Cells.....	1034
<i>Vladimir L. Meca, Oscar Santiago, Elena Posada, Rafael D'Amore-Domenech, Antonio Villalba-Herreros, Teresa J. Leo</i>	
Real Time Data Assimilation for the Thermodynamic Modeling of a Cryogenic Fuel Tank	1041
<i>Pedro Marques, Samuel Ahizi, Miguel Alfonso Mendez</i>	
Multi-Criteria Optimization of Hydrogen Energy Supply Chains Considering Economic and Environmental Impacts: Theoretical Case Study in the Context of Balearic Islands	1053
<i>Florent Montignac, Maria-Candelaria Arpajou, Diego Larrahondo Chavez, Alain Ruby</i>	

Development of Electrodes for Fuel Cells Pt-Free Load.....	1066
<i>Teresa J. Leo, Elena Posada, Oscar Santiago, Vladimir Meca, Isabel Carrillo, Eva Chinarro</i>	
Syngas-Fed Cogeneration for the Tertiary Sector: Lessons Learnt from the Synbiose Project	1071
<i>Mirko Morini, Andrea Borghi, Nicola Casari, Agostino Gambarotta, Edoardo Micconi, Michele Pinelli, Alessio Suman</i>	
Implementation of a Semi-Empirical Model for a Low-Temperature Alkaline Electrolyzer in Aspen HYSYS®	1083
<i>Mosè Rossi, Paolo Vitulli, Andrea Monforti Ferrario, Gabriele Comodi</i>	
Performance Model of a Proton-Exchange Membrane (PEM) Operating in Steady-State Conditions with Aspen HYSYS®	1094
<i>Mosè Rossi, Angelo Di Domenico, Paolo Vitulli, Gabriele Comodi</i>	
Test Bench for Electricity Or Hydrogen Production from Aqueous Methanol.....	1104
<i>Vladimir L. Meca, Rafael D'Amore-Domenech, Antonio Villalba-Herreros, Teresa J. Leo</i>	
Improving the Carbon Efficiency of Two-Stage DME Synthesis Based on Wheat-Straw Gasification	1110
<i>René Kofler, Lasse Røngaard Clausen</i>	
Sizing of a Green Hydrogen Energy System to Power a Micro-Grid for Residential Use	1122
<i>Abraham Quintana, José A. Carta, Fabián Déniz</i>	
Pollutant Testing (NO _x , SO _x and CO) of Commercialized Micro-Combined Heat and Power (mCHP) Fuel Cells	1134
<i>Nicolas Paulus, Davila Camila, Lemort Vincent</i>	
Economic and Environmental Impacts of Integrating Hydrogen-Based Technologies in the Design Optimization of Sector-Coupling Energy Systems in Residential Districts	1146
<i>Mohamed Eldakadosi, Jana Schneeloch</i>	
Dynamic Modeling of a Power-To-Gas System for Green Methane Production from Wind Energy.....	1158
<i>Lorenzo Ferrari, Valeria Pignataro, Angelica Liponi, Eleonora Bargiacchi, Lorenzo Ferrari</i>	
Process Simulation of Fuel Production Through Integration of High-Temperature Co-Electrolysis in a Biomass-To-Liquid Process.....	1170
<i>Benjamin Steinrücken, Marcel Dossow, Maximilian Schmid, Maximilian Hauck, Sebastian Fendt, Florian Kerscher, Hartmut Spliethoff</i>	
The Implications of the Basic Materials Industry Electrification on the Cost of Hydrogen.....	1182
<i>Alla Toktarova, Lisa Göransson, Filip Johnsson</i>	
Exergoeconomic Model of a PEM Fuel Cell.....	1193
<i>Jose Ricardo Sodre, Abdelnasir Omran</i>	
Effects of the Use of 100% Biodiesel (B100) Obtained from Used Vegetable Oils on the Consumption, Emissions, and Performance of Vehicles and Equipment.	1205
<i>Luis Serrano, Nuno Clara, Diogo Silva, Paulo Matos Carvalho</i>	

H. PROCESS INTEGRATION, PROCESS SIMULATION AND OPTIMIZATION, PROCESS MONITORING & CONTROL.

Rolling Horizon Dynamic Real-Time Optimization of a Solar Thermal Plant with a Planning Phase.....	1217
<i>Alix Untrau, Sabine Sochard, Frédéric Marias, Jean-Michel Reneaume, Galo A. C. Le Roux, Sylvain Serra</i>	
Highly Efficient Heat Integration of a Power-To-Liquid Process Using MILP.....	1229
<i>David Huber, Kathrin Werdinig, Felix Birkelbach, René Hofmann</i>	
Simulation-Based Performance Assessment for Building Automation Systems.....	1240
<i>Felix Stegemerten, Maghnie Marwa, Kümpel Alexander, Müller Dirk</i>	
Design and Operational Optimisation of a Combined Cooling, Heating and Power Plant to Enable Waste Heat Integration into an Existing District Heating Network.....	1252
<i>Jan Stock, Malte Berrenberg, André Xhonneux, Dirk Müller</i>	
Evaluation and Optimization of the Integration of Ice Energy Storage Systems in Interconnected Supply Networks for Non-Residential Buildings	1264
<i>Marco Griesbach, Andreas König-Haagen, Florian Heberle, Dieter Brüggemann</i>	
Improving Computation Time for Optimization Runs of Modelica-Based Energy Systems.....	1276
<i>Sven Klute, Markus Hadam, Mathias Van Beek, Marcus Budt</i>	
Techno-Economic Optimization of an Innovative Plant for Sustainable Iron Reduction.....	1287
<i>Elisa Corbean, Jannik Neumann, Frank Dammel, Peter Stephan, Stefan Ulbrich</i>	
A Hybrid Algorithm Based on Bayesian Optimization and Interior Point OPTimizer for Optimal Operation of Energy Conversion Systems.....	1299
<i>Loukas Kyriakidis, Miguel Alfonso Mendez, Martin Bähr</i>	
Metamodels for Economically Optimized Closed Brayton Cycles	1311
<i>Andreas Siman Menzel, Francesco Witte, Julio Augusto Mendes Da Silva, Icaro Figueiredo Vilasboas, Armando Sá Ribeiro Junior</i>	
Combined Physics-Data Driven Modeling for Design and Operation Optimization of an Energy Concept.....	1322
<i>Rushit Kansara, Michael Lockan</i>	
Optimization Tools for the Operational Dispatch of Power Generation Systems to Reduce Diesel Fuel Consumption	1334
<i>Daniel Sempertegui, Cesar Alberto Ayma-Ramos, Filiberto Soto Encinas, Renan Orellana Lafuente</i>	
Operation Planning with Thermal Storage Units Using MILP: Comparison of Heuristics for Approximating Non-Linear Operating Behavior.....	1345
<i>Felix Birkelbach, Lukas Kasper, Paul Schwarzmayr, René Hofmann</i>	
Robust Optimization of the Energy Concept of an Industrial Plant w.r.t. Uncertain Energy Costs and Environmental Conditions.....	1351
<i>Michael Lockan, Rushit Kansara</i>	
Multi-Criteria Scenario Development for Linear Optimization Models Utilizing Carbon-Containing Exhaust Gases.....	1363
<i>Matthias Sadlowski, Chae Eon Lim</i>	

Optimization of Energy Systems Sizing and Operation Including Heat Integration and Storage	1375
<i>Rafael Nogueira Nakashima, Peter Vang Hendriksen, Henrik Lund Frandsen</i>	
A Seasonal Assessment of a Hybrid Combined Heat and Power System with Green Hydrogen Storage in Rio De Janeiro (Brazil) Through an Energetic, Exergetic, Exergoeconomic, and Environmental Analysis.....	1387
<i>José Eduardo Carvalho, Remi Revellin, Romuald Rulliere, Florian Pradelle</i>	
Development and Assessment of an IoT System for Monitoring Air and Soil Quality in the Agricultural Sector	1399
<i>Pedro R. Gomes, António Nicolau, Ana C. Ferreira, Bruna Ramos, João Ferreira, José Costa, Filipe Santos, Eduardo Santos, Gonçalo Teixeira</i>	
Superheated Steam Drying for Paper Production: Process Efficiency Assessment.....	1411
<i>Veronika Wilk, Sophie Knöttner, Gerwin Drexler-Schmid, Tilman Barz</i>	
Identifying the Ideal Process Configuration for a Green Methanol Production Plant Dependent on Economic Boundary Conditions.....	1422
<i>Simon Maier, Ralph-Uwe Dietrich, Yoga Rahmat</i>	
A Fast Heuristic Algorithm for Multi-Energy System Design.....	1432
<i>Antoine Mallégo, Arwa Khannoussi, Bruno Lacarrière, Mehrdad Mohammadi, Patrick Meyer</i>	
A MILP Approach for Hybrid Energy Systems Design for Sustainable Maritime Mobility	1444
<i>Matteo Cavo, Luca Mantelli, Massimo Rivarolo, Andriy Vasylyev</i>	
Integration of the Compression Units of the Processing Plant with an Organic Rankine Cycle for Power Generation and Cooling Process	1456
<i>Ali A. Bidgoli, Jurandir Itizo Yanagihara</i>	
Eco-Efficiency Dependencies for Wastewater Treatment Plant Operation.....	1468
<i>Ramon Vilanova, Silvana Revollar, Montse Meneses, Pastora Vega, Mario Francisco</i>	
A Novel Two-Bed Reactor for a Chemical Looping Combustion System with a Moving Bed.....	1479
<i>Anna Zylka, Jaroslaw Krzywanski, Tomasz Czakiert, Marcin Sosnowski, Karolina Grabowska, Anna Kulakowska, Dorian Skrobek, Wojciech Nowak, Yunfei Gao</i>	
Modeling of Submerged Membrane Bioreactor Filtration Process Using Deep Learning LSTM Neural Network	1486
<i>Nur Sakinah Ahmad Yasmin, Norhaliza Abdul Wahabb, Kumerasan A. Danapalasingam, Montserrat Meneses, Ramon Vilanova</i>	

I. RENEWABLE ENERGY.

Alternative Methodology for Modeling Direct Steam Generation in Parabolic Collectors: A Study Case in Northeast Mexico	1496
<i>Eduardo González-Mora, María Dolores Durán-García</i>	
Experimental Study of an Ultrasonic Spray Atomiser as an Evaporative Cooler.....	1507
<i>Javier Ruiz Ramírez, Pedro Martínez Martínez, Jonás Pérez Marco, Manuel Lucas Miralles, Alberto Rodríguez Martínez, Pedro Navarro Cobacho</i>	
Data-Driven Techno-Economic Analysis of Rooftop Photovoltaic Systems in the Spanish Residential Sector at Municipal Level.....	1519
<i>Manel Vallès, Raul Saez, Dieter Boer, Adedamola Babajide Shobo</i>	

Economical and Ecological Optimization of Renewable Energy Solutions for Thermal Demands of Livestock Farms	1530
<i>Manon Everaert, Willem Faes, Jarissa Maselyne, Steven Lecompte</i>	
Energy Evaluation of Hydrogen Production Integrated into the Ethanol and Sugar Production Process.....	1542
<i>Maria Luisa Fernandes Da Silva, Rogério Luis Aguilera, Milagros Cecilia Palacios Bereche, Antonio Garrido Gallego, Silvia Azucena Nebra, Reynaldo Palacios Bereche</i>	
Energy Assessment of Biofuels Production from Fast Pyrolysis of Sugarcane Straw, and Upgrading of the Bio-Oil Produced Through Hydrotreatment.....	1553
<i>Reynaldo Palacios Bereche, Bruna Stella De Freitas Santos, Milagros Cecilia Palacios Bereche, Antonio Garrido Gallego, Silvia Azucena Nebra De Pérez</i>	
Design Rules for a PV-Inverter in Belgium: Evaluation of Actual Rules of Thumb	1565
<i>Hugo Monteyne, Wim Beyne, Rik Koch, Michel De Paepe</i>	
Segmental Application of Two Heat Absorption Intensification Methods in Parabolic Trough Collector Solar Loop	1577
<i>Bartosz Stanek, Lukasz Bartela, Daniel Weceł</i>	
Design and Simulation of a Banki Cross-Flow Wind Turbine for Highways Under High Turbulence and High Altitude Conditions.....	1588
<i>Daniel Felipe Sempertegui-Tapia, Eduard Matheo Alave-Vargas, Valentina Rita Villarroel-Beltran, Renan Orellana Lafuente, Cecilia Tapia-Siles</i>	
Covering Energy Demands of Buildings with an Adaptive Radiative Collector and Emitter (AD-RCE).....	1600
<i>Ingrid Martorell, Jesús Monterrubio, Roger Vilà, Jonathan Cofré, Cristian Solé, Albert Castell</i>	
Comparison Between an Artificial Neural Network and Poppe's Model for Wet Cooling Tower Performance Prediction in CSP Plants.....	1609
<i>Javier Ruiz Ramirez, Pedro Navarro Cobacho, Manuel Lucas Miralles, Lidia Roca Sobrino, Juan Miguel Serrano Rodriguez, Patricia Palenzuela Ardila</i>	
Exergy and Environmental Analysis of the Substitution of Coal for Biomass in Thermal Power Plants in Brazil	1621
<i>Leonardo Bassi, Silvio De Oliveira Junior</i>	
Evaluation and Possible Direct Utilization of Low- To Medium-Enthalpy Geothermal Resources for the Sustainable Development of the African Continent.....	1631
<i>Claudio Zuffi, Luca Socci, Andrea Rocchetti, Daniele Fiaschi, Giampaolo Manfrida</i>	
Field and Central Receiver Design Methodology based on Multi-Parameter Optimization by the Design of Experiments (DOE) Technique	1643
<i>Ruben Barbero, Guillermo Ortega, Antonio Rovira, Fernando Varela</i>	
Exergy Assessment of Electricity Generation via Biomass Gasification by Neural Network Algorithm	1655
<i>Gabriel Vargas, Silvio De Oliveira Junior</i>	
Adaptive Radiative Collectors and Emitters (AD-RCE) to Improved the Efficiency of Heat Pumps.....	1668
<i>Marc Medrano Martorell, Roger Vilà, Jesús Monterrubio, Mohammed Reda Haddouche, Lidia Rincón</i>	

A Simple Truncation Criterion in CPCs Using Constructal Theory	1678
<i>Eduardo González-Mora, Eduardo Armando Rincón-Mejía</i>	
Exergy Cost Assessment of Very High Gravity (VHG) Fermentation in the Sugarcane Industry.....	1689
<i>Reynaldo Palacios Bereche, Milagros Cecilia Palacios Bereche, Antonio G Gallego, Luis M. Serra, Miguel A. Lozano, Silvia A. Nebra</i>	
PV Potential of the Public Building Stock of the Basque Country.....	1701
<i>Mikel Garro, Ana Picallo-Perez, Pablo Hernandez-Cruz, Juanmaria Hidalgo-Betanzos, Josemaria Sala-Lizarraga, Imanol Ruiz De Vergara-Ruiz De Azua</i>	
A State-Of-The-Art Review of Geographic Information System Applications, the Main Criteria of Selection, and Available Data that May Be Used in the Process	1713
<i>Krzysztof Szczepaniec, Fergal O'Rourke, Peter Ryan</i>	
Evaluation of Weather Datasets for Rural Energy Communities Simulation	1725
<i>Manel Vallès, Raul Saez, Adedamola Babajide Shobo, Rasool Kazemi, Dieter Boer</i>	
Dynamic Analysis of a Power Plant Producing Liquefied Biomethane for Heavy Road Transport.....	1735
<i>Luca Cimmino, Francesco Calise, Francesco Liberato Cappiello, Maria Vicidomini</i>	
An Investigation of the Synthesis and Optical Properties of Novel Ag/ZnO Hybrid Nanofluids for Spectral Splitting in Photovoltaic-Thermal Systems.....	1747
<i>Sandesh Surendra Chougule, Gaurav Bolegave, Bhaskar Soni, Vinayak Kamble, Christos N. Markides</i>	
Technical Economic Study of a Collective Photovoltaic Installation.....	1755
<i>Daniela Contreras, Luis Mazorra Aguiar, Eduardo Vega Fuentes</i>	
The New Role of Sustainable Hydropower in Flexible Energy Systems and Its Technical Evolution Through Innovation and Digitalization	1767
<i>Giovanna Cavazzini, Elena Vagnoni, Dogan Gezer, Ioannis Anagnostopoulos, Pavel Rudolf, Eduard Doujak, Marko Hocevar</i>	
Feasibility of Solar Photovoltaic Energy as an Energy Source for the Electrowinning of Zinc in South Africa.....	1777
<i>Ricardo Magdalena, Nicole Uys, Jochen Petersen</i>	
Energy, Exergy and Exergo-Economic Analyses of Super-Critical CO ₂ Cycles for the Exploitation of a Geothermal Resource in the Mt. Amiata Region.....	1789
<i>Daniele Fiaschi, Lorenzo Talluri, Nicola Di Michele, Pietro Ungar</i>	
Thermo-Economic Assessment of an Organic Rankine Cycle System for Repowering Application in a Landfill Biogas Power Plant.....	1801
<i>Lucas Loyola, Lucas Antônio Silveira Silva, Átila Pavan Vasconcellos, José Joaquim Conceição Soares Santos, João Luiz Marcon Donatelli, Carla César Martins Cunha</i>	
 <u>J. ENERGY-WATER NEXUS, DESALINATION, WASTE WATER TREATMENT.</u>	
A Tool for Effluent Characterization and Design of Natural Treatment Systems for Wastewater (NTSW) for Livestock Farms with High Organic Load in Isolated Island Environments.	1812
<i>Tania Del Pino García Ramirez, Carlos Alberto Mendieta Pino, Saulo Brito Espino, Alejandro Ramos Martin, Federico León Zerpa</i>	
A Comprehensive Review of Water Distillation Technologies for Green Hydrogen Production	1822
<i>Rolando Argandona, Assaad Zoughaib, Rasha Mustapha</i>	

NICEST - Master Study Proposal on Next Generation Industrial Control Engineering for Sustainable Water System Treatment	1834
<i>Ramon Vilanova, Montse Meneses, Manuel Dominguez, Ana Maria Blanco, Marian Barbu, Dan Selisteanu, Antonio Visioli, Andrea Capodaglio, Nikolaos Andritsos, Petros Samaras, Konstantinos Plakas</i>	
4E Analyses of Integration of Microbial Desalination Cell, Humidification-Dehumidification and Reverse Osmosis Desalination to Produce Sustainable Freshwater Based on Solar and Wind Energies	1843
<i>Ana Maria Blanco Marigorta, Mohammad Hassan Khoshgoftar Manesh, Sepehr Davadgaran, Seyed Alireza Mousavi Rabeti</i>	
A Triple Solar Desalination System Integrated with a Biomass Fuelled SCO2 Power Cycle: Thermodynamic Modelling	1854
<i>Hamed Ghiasirad, Towhid Gholizadeh Baris, Saeed Rostami, Bartosz Stanek, Anna Skorek-Osikowska, Lukasz Bartela</i>	
Innovative Low-Grade Sorption Desalination Technology for Application on Board of Vessels.....	1866
<i>Andrea Frazzica, Yannan Zhang, Antonino Bonanno, Valeria Palomba, Vincenza Brancato, Walter Mittelbach</i>	
Solar Energy Drier for Algae with Water Recovery for Island Applications	1873
<i>Eden Mamut, Marcel Ionescu, Laurentiu Oancea</i>	

K. ENERGY POLICY AND PLANNING.

The Impact of Spatial Resolution on Optimal Renewable Energy Portfolios.....	1885
<i>Aina Maimó-Far, Victor Homar</i>	
Towards CO2 Valorisation in a Multi Remote Renewable Energy Hub Framework.....	1893
<i>Victor Dachet, Raphaël Fonteneau, Amina Benzerga, Damien Ernst</i>	
Development of an Optimization-Based Methodology for Subsidy Programs in Residential Buildings	1905
<i>Nico Fuchs, Jonas Baumgärtner, Dominik Hering, Dirk Müller</i>	
Cost Sensitivity Analysis on Swiss Energy Transformation Towards Net-Zero Target.....	1917
<i>Xiang Li, Matthieu Souttre, Francois Marechal</i>	
Landlord-Tenant Dilemma: How Does the Conflict Affect the Design of Building Energy Systems?	1923
<i>Larissa Kühn, Lars Braun, Nico Fuchs, Laura Maier, Dirk Müller</i>	
Electricity Demand Forecasting for Rural Communities in Developing Countries: Calibrating a Stochastic Model for the Bolivian Case	1935
<i>Claudia Sanchez-Solis, Pietro Di Betta, Nicolò Stevanato, Sergio Balderrama, Emanuela Colombo, Sylvain Quoilin</i>	
Impact of Detailed Hydropower Representation in National Energy System Modelling.....	1947
<i>Matteo Catania, Federico Parolin, Fabrizio Fattori, Paolo Colbertaldo</i>	
Modelling Financing Schemes for Energy System Planning: A Mini-Grid Case Study.....	1958
<i>Giacomo Crevani, Castro Antonio Soares, Emanuela Colombo</i>	

Comparative Analysis of Dynamic and Linear Programming Energy Systems Models Applied to the Bolivian Power System	1970
<i>Alizon Huallpara, Marco Navia, Isaline Gomand, Sergio Balderrama, Matija Pavicevic, Sylvain Quoilin</i>	
Techno-Economic Optimization of a Multimodal Energy System for a Fully Renewable Energy-Supplied Danish Island.....	1982
<i>Tao Yang, Konstantin Filonenko, Benjamin B. L. Larsen, Vinusan Jeyarajah, Cecilie Larsen, Muhyiddine Jradi, Christian Veje</i>	
Using PyPSA-Earth to Address Energy Systems Modelling Gaps in Developing Countries. a Case Study for Bolivia	1994
<i>Carlos Fernandez, Sergio Balderrama, Sylvain Quoilin</i>	
Towards Low-Carbon Energy Systems: The Case of Bolivia Until 2035	2006
<i>Pablo Jimenez Zabalaga, Sergio Balderrama, Matija Pavicevic, Evelyn Cardozo, Paolo Thiran, Gauthier Limpens, Hervé Jeanmart</i>	
Decarbonisation & Optimization Strategies in Distributed Energy Community Characterized by Demand of Electricity, Cooling, and Heating	2019
<i>Stefano Mazzoni, Greta Magnolia, Marco Gambini, Michela Vellini</i>	
GHG Mitigation in the Electricity Production System in Canary Islands. a Proposal for a Management and Optimization Tool in Generation.....	2031
<i>Carlos Alberto Mendieta Pino, Juan Carlos Lozano Medina, Alejandro Ramos Martín, Fabián Déniz Quintana, Vicente Henríquez Concepción</i>	
Spatial National Multi-Period Long-Term Energy and Carbon Planning Scenarios, Including Temporal Network Security Analysis. Complementing Renewable Energy and Hydropower Due to Climate Change	2043
<i>Javier Urquizo, Ben Cevallos</i>	
 <u>L. ENERGY STORAGE.</u>	
External Control Strategy for Seasonal Thermal Energy Storage Operation.....	2055
<i>Jaroslav Milewski, Olaf Dybinski, Arkadiusz Szczesniak</i>	
Modelling and Performance Analysis of a Low Temperature A-CAES System Coupled with Renewable Energy Power Plants	2067
<i>Francesca Carolina Marcello, Davide Micheletto, Daniele Cocco, Vittorio Tola</i>	
Experimental Analysis of the Feasibility of Using the Ground as a Temporary Energy Accumulator	2080
<i>Andrés Meana-Fernández, María José Suárez-López, David García-Menéndez, Eduardo Blanco-Marigorta, Jesús Ignacio Prieto-García</i>	
Modeling of a Combined Solar System Including a Thermal Battery Based on Phase Change Materials	2092
<i>Diane Le Roux, Sylvain Serra, Sabine Sochard, Zakaria Aketouane, Tessa Hubert, Ryad Bouzouidja, Alain Sempey, Jean-Michel Reneaume</i>	
Low-Temperature Compressed Air Energy Storage with Reversibly Operable Turbo- And Piston Machines	2104
<i>Markus Hadam, Marcus Budt</i>	

Analytical Prediction of the Phase Change Front Movement to Characterize Tube in Tube Phase Change Material Heat Exchangers	2116
<i>Maité Goderis, Julie Van Zele, Kenny Couvreur, Wim Beyne, Michel De Paepe</i>	
Thermodynamic and Economic Analysis of a Carnot Battery with a Two Zone Water Tank as Thermal Energy Storage	2126
<i>Josefine Koksharov, Jonas Klingelhofer, Frank Dammel, Peter Stephan</i>	
Energy-Power Relations and Ragone Plots for Packed Bed Thermal Energy Storage	2138
<i>Inga Beyers, Astrid Bensmann, Richard Hanke-Rauschenbach</i>	
Integration of Salt Cavern Hydrogen Storage in a 100% Renewable Energy Supply Scenario	2149
<i>Francesco Piovesan, Ali Akbar Eftekhari</i>	
Methanol-Based Thermal Generation for Energy-Saving District Heating Networks: A Techno-Economic Optimization	2160
<i>Diego Antonio Rodriguez Pastor, Elisa Carvajal, Víctor Soltero, Ricardo Chacartegui, José Antonio Becerra</i>	
Thermo-Economic Optimization of a Carnot Battery Under Transient Conditions	2171
<i>Márcio Santos, Jorge André, Ricardo Mendes, José B. Ribeiro</i>	
Power Vs. Capacity Performances of Thermally Integrated MH-PCM Hydrogen Storage Solutions: Current Status and Development Perspectives	2183
<i>Vesselin Krastev, Gino Bella, Giacomo Falcucci, Lorenzo Bartolucci, Stefano Cordiner, Vincenzo Mulone</i>	
Potential for Optimal Operation of Industrial Heat Pumps with Thermal Energy Storage for Emissions and Cost Reduction	2194
<i>Roger Padullés, Magnus Lyck Hansen, Martin Pihl Andersen, Jonas Kjær Jensen, Brian Elmegaard, Benjamin Zühlsdorf</i>	
Modelling an Ammonia Cycle for Thermochemical Energy Storage	2206
<i>Alejandro García Guzmán, Ricardo Chacartegui Ramírez, Jose Antonio Becerra Villanueva, Diego Antonio Rodríguez Pastor</i>	
Evaluation of Dual Side Cooling System for Prismatic Batteries for Vehicle Applications	2218
<i>Said Madaoui, Bartłomiej Guzowski, Roman Gozdur, Zlatina Dimitrova, Nicolas Audiot, Jocelyn Sabatier, Jean-Michel Vinassa, Franck Guillemard</i>	
Potential Evaluation of Carnot Battery Integrating Waste Heat Recovery in Industry	2229
<i>Olivier Thomé, Olivier Dumont, Vincent Lemort</i>	
Utilizing Historical Operating Data to Increase Accuracy for Optimal Seasonal Storage Integration and Planning	2241
<i>Maximilian Sporleder, Yuwei Xu, Michael Rath, Mario Ragwitz, Mathias Van Beek</i>	
Comparative Analysis of Sensible Heat and Latent Heat Packed Bed Cold Energy Storage for Liquid Air Energy Storage Systems	2253
<i>Afshin Mashayekh, Jung Hwan Park, Nishith Babubhai Desai, Jeong Ik Lee, Fredrik Haglind</i>	
Techno-Economic Analysis of Latent Heat Thermal Energy Storage Integrated Heat Pump for Indoor Heating	2265
<i>Lianying Shan, Andrew Martin, Justin Ning-Wei Chiu</i>	
Off-Design Analysis of a TES-Based Electricity Energy Storage System	2277
<i>Alberto Benato, Matteo Pecchini, Francesco De Vanna, Anna Stoppato</i>	

Green Hydrogen and Ammonia Synthesis: A Techno-Economic Feasibility Analysis for Different Plant Sizes (1 – 60 MW) and Scenarios	2288
<i>Massimo Rivarolo, Daria Bellotti, Loredana Magistri</i>	
Methodology for the Sizing of a Carnot Battery Based on a Rankine Cycle and Application to a 10 kWe System for District Heating Application	2300
<i>Olivier Dumont, Chiara Poletto, Olivier Thomé, Vincent Lemort</i>	
Role of Energy Storage in Residential Energy Demand Decarbonization: System-Level Techno-Economic Comparison of Low-Carbon Heating and Cooling Solutions.....	2309
<i>Marko Aunedi, Andreas V. Olympios, Antonio M. Pantaleo, Matthias Mersch, Christos N. Markides</i>	
The Energy Storage Capabilities of Single and Mixture Sorbent Salts Impregnated Pumice and Anodic Aluminium Oxide Based Composite Materials.....	2322
<i>Behiye Yüksel, Zafer Utlu, Esra Ayan</i>	
Concept of the Non-Equilibrium Multi-Dimensional Model of the Charging/Discharging Low-Temperature Thermochemical Storage Unit.....	2330
<i>Piotr Lapka, Mateusz Mlynarczyk, Piotr Lapka, Natalia Mikos-Nuszkiewicz, Piotr Furmanski</i>	
Application of Flat Plate Latent Heat Thermal Energy Storage for Waste Heat Recovery and Energy Flexibility in Maritime Sector	2342
<i>Adriano Sciacovelli, Pouriya Niknam, Lorenzo Ciappi</i>	
Efficiency Analysis in the Chemical Looping Process of Base Metals	2354
<i>Israel Marqués Valderrama, Ricardo Chacartegui Ramirez, Jose Antonio Becerra Villanueva, Carlos Ortiz Dominguez, Diego Antonio Rodríguez Pastor</i>	
Performance Comparison of Cold Thermal Storage for Gas Turbine Inlet Cooling with Traditional Energy Storage Technologies in Current Electricity Markets.....	2366
<i>Alberto Vannoni, Alessandro Sorce</i>	
<u>M. ENERGY USE IN THE INDUSTRIAL, RESIDENTIAL, TRANSPORTATION, AGRICULTURAL SECTORS. DISTRICT HEATING/COOLING.</u>	
Analysis of Building Energy Performance Based on Sensor Data for Building Retrofitting	2378
<i>Noelia Vicente Gómez, Belén Zurro García, Sara González Moreno, Imanol Ruiz De Vergara, Jose Maria Sala Lizarraga, José Manuel González Martín, Ana Picallo Pérez</i>	
Heating and Cooling Load Analysis of a Climate Neutral Proof of Concept Chicken Farm	2390
<i>Xander Van Heule, Jera Van Nieuwenhuyse, Willem Faes, Gerlinde De Vogeleer, Steven Lecompte</i>	
Holistic Approach to Improve Cabin Air Quality in Electric Vehicles and Energy Savings	2402
<i>Matisse Lesage, David Chalet, Jérôme Migaud, Christoph Krautner</i>	
Analysis of Sodium Water Reaction as Heat Source for District Heating and Cooling.....	2414
<i>Alberto Abánades Velasco, Juan Guerrero Padrón, Angel Jimenez Álvaro</i>	
Optimization of the Pipe Diameters and the Dynamic Operation of a District Heating Network	2423
<i>Malik Hakim Elhafai, Arley Nova-Rincon, Sabine Sochard, Sylvain Serra, Jean-Michel Reneaume</i>	
Energy Efficient Room Thermal Control Strategy with Consideration of Occupants' Thermal Comfortability	2435
<i>Jihong Wang, Yunfei Bai, Chenghao Li, Wei He</i>	

Hierarchical Distributed Model Predictive Control for Building Energy Systems.....	2444
<i>Maximilian Mork, André Xhonneux, Dirk Müller</i>	
Optimal Integration of Power-To-Gas and District Heating Through Waste Heat Recovery from Electrofuel Production.....	2456
<i>Emanuela Marzi, Agostino Gambarotta, Francesco Ghionda, Mirko Morini, Costanza Saletti</i>	
Analysis of Energy, Economic and Environmental Performance of Solar Water Heaters for Domestic Hot Water Supply in Northern European Climate.....	2468
<i>Anandhi Parthiban, Eoin Cotter, David McCloskey</i>	
Optimization-Based Energy System Planning Under Long-Term Uncertainty: Rapid Monte Carlo Analysis Using Linear Regression.....	2480
<i>Hagen Seele, Jan Tautorius, Christiane Reinert, Niklas Von Der Aßen</i>	
Simplified Dispatching Method for Unlocking Energy Flexibilities of Decentralized Energy Systems for the Day-ahead and Balancing Power Market.....	2491
<i>Joram Wasserfall, Mahmoud Ouso, Stefan Kirschbaum</i>	
Flexibility from Industrial Demand-Side Management in a Net-Zero Sector-Coupled Energy System.....	2503
<i>Patricia Mayer, Mario Heer, David Yang Shu, Nik Zielonka, Ludger Leenders, Florian Baader, André Bardow</i>	
Qualitative Comparison of On-Site Production of Hydrogen and Its Synthesis Products for Steel Processing Industry.....	2514
<i>Gabriela Zabik, Felix Birkelbach, René Hofmann</i>	
Optimal Design of Renewable Power-To-Hydrogen Systems for the Decarbonization of a Semiconductor Industry.....	2523
<i>Davide Trapani, Paolo Marocco, Marta Gandiglio, Massimo Santarelli</i>	
Identification of Typical District Configurations: A Two-Step Global Sensitivity Analysis Framework.....	2532
<i>Arthur Chuat, Jonas Schnidrig, Cédric Terrier, Francois Marechal</i>	
A MILP Approach for Demand Management in Renewable Energy Communities with Residential End-Users.....	2544
<i>Paolo Lazzeroni, Gianmarco Lorenti, Francesco Moraglio, Maurizio Repetto</i>	
Energy and Exergy Analysis of a Biodiesel Plant.....	2556
<i>Flavia Barbosa, Paulo Mendes, Carlos Castro, Senhorinha Teixeira, José Carlos Teixeira</i>	
Metaheuristic Vs. Mathematical Optimization: A Comparison of Methods for the Design Optimization of Residential Building Energy Systems.....	2569
<i>Pierre Pasqual Krisam, Lena Rosin, Sebastian Glombik, Eva Schischke</i>	
Innovative Thermal Management Operating Strategies for Battery-Electric Heavy-Duty Trucks.....	2581
<i>Jan Friedrich Hellmuth, Michael Matthias Steeb, Markus Pollak, Florian Jäger, Wilhelm Tegethoff, Jürgen Köhler</i>	
Thermo-Economic Comparison of CO ₂ and Water as a Heat Carrier for Long-Distance Heat Transport from Geothermal Sources.....	2593
<i>Pietro Ungar, Christopher Schiffler, Christoph Wieland, Giampaolo Manfrida, Hartmut Spliethoff</i>	

Large Building Stock Energy Simulation for the Design of District Heating Networks : A Case Study on Building Retrofit Policies.....	2603
<i>Mazarine Roquet, Dewallef Pierre</i>	
Towards a Low Carbon Future: Evaluating Scenarios for an Energy Community Through a Multi-Objective Optimisation Approach	2614
<i>Ronelly José De Souza, Emanuele Nadalon, Melchiorre Casisi, Mauro Reini, Luis María Serra De Renobales, Miguel Ángel Lozano</i>	
Energy Cost Impact Analysis on the Total Cost of the Crop Production for Different Operating Conditions. a Salad Production Case Study	2626
<i>Alfonso William Mauro, Alice Arcasi, Giovanni Napoli, Antonio Marco Pantaleo</i>	
AIDRES: A Database for the Decarbonisation of the Heavy Industry in Europe.....	2637
<i>Luc Girardin, Ivan Kantor, Shivom Sharma, Daniel Florez-Orrego, Meire Ribeiro-Domingos, Rafael Castro-Amoedo, Julia Granacher, Yi Zhao, Joris Valee, Juan David Correa, François Maréchal</i>	
A Nonlinear Optimization Method for Expansion Planning of District Heating Systems with Graph Preprocessing.....	2649
<i>Jerry Lambert, Hartmut Spliethoff</i>	
Techno-Economic Comparison of a Solar Absorption Chiller and Photovoltaic Compression Chiller.....	2661
<i>Juan José Roncal Casano, Paolo Taddeo, Alberto Abánades-Velasco, Javier Rodríguez-Martín, Javier Muñoz-Antón</i>	
Energy Performance of Loading and Hauling Operations in Opencast Mines	2673
<i>Lalit Sahoo, Seema Ashishan Topno</i>	
Energetic and Economic Analysis of Novel Concentrating Solar Air Heater Using Linear Fresnel Collector for Industrial Process Heat.....	2682
<i>Antonio Famiglietti, Antonio Lecuona</i>	
Efficient Energy Mapping for Supporting Green Transition in Industry	2692
<i>Nasrin Arjomand Kermani, Martin Ryhl Kærn, Rikke Hovedskov Andersen, Jorrit Wronski, Fridolin Müller Holm, Brian Elmegaard</i>	
Experimental and Numerical Study of Geothermal Rainwater Tanks for Buildings Passive Cooling	2703
<i>Lucas Striegel, Bouvenot Jean-Baptiste, Edouard Walther, Hossein Nowamooz</i>	
Mild Hybrid Multi-Energy Systems: Waste Energy Recovery by Bottom ORC System	2714
<i>Roberto Capata</i>	
A Top-Down Approach Based on Simulations and Optimisations to Evaluate Renovation of Public Buildings	2728
<i>Charlotte Marguerite, I-Gede Parwatha, Cécile Goffaux, Anne Meessen</i>	
First Step to Define a Predictive Model of the Behaviour of a Building's Thermal System to Analyse the Climate Change Influence	2740
<i>Irati Prol Godoy, Ana Picallo Perez, Iñaki Inza, Roberto Santana, Jose María Sala Lizarraga, Javier Rey Martínez</i>	
Innovative Indicators for Quantifying Energy Flexibility of District Heating Networks	2752
<i>Jaume Fitó, Julien Ramousse, Frédéric Wurtz</i>	

Simulation Model for the Evaluation of the Effect of Office Dressing Code on Building Space Cooling Demand.....	2762
<i>Maria Vicidomini, Francesco Calise, Francesco Liberato Cappiello, Luca Cimmino</i>	
Efficient Solving of Time-Coupled Energy System MILP Models Using a Problem Specific LP Relaxation.....	2774
<i>Stefan Kirschbaum, Marion Powilleit, Merlind Schotte, Furkan Özbek</i>	
Innovative Waste Heat Valorisation Technologies for Zero-Carbon Ships - A Review	2786
<i>Adriano Sciacovelli, Robin Fisher, Pouriya Niknam, Lorenzo Ciappi</i>	
Method for Building's Thermal Flexibility in a Multi Energy Vector District.....	2798
<i>Mathieu Brugeron, Mathieu Vallée, Aurélie Fouquier, Antoine Leconte, Adrien Brun</i>	

N. ENVIRONMENTAL IMPACT OF ENERGY SYSTEMS. SUSTAINABILITY, RESILIENCE, & CIRCULAR ECONOMY. CO2 AND GHG MITIGATION.

Integration of Life Cycle Impact Assessment in Energy System Modelling	2810
<i>Jonas Schnidrig, Justine Brun, François Maréchal, Manuele Margni</i>	
CO2 Capture from Flue Gases: A Possibility to Reduce the CO ₂ Footprint in Offshore Oil Installations	2823
<i>Waldyr Luiz Ribeiro Gallo, Murilo José Castro</i>	
A Comparative Study of Standard Carbon Capture Process and Advanced Flash Stripper Configuration Using MEA	2835
<i>Ruitao Sun, Peng Huang, Jie Li, Li Sun</i>	
Sustainability Assessment of Typical Energy Storage Technologies for Peak Shaving Scenarios Based on the Full Life Cycle	2843
<i>Xiaoqu Han, Nana Chen, Yanxin Li, Xiaofan Huang, Jiarui Li, Junjie Yan</i>	
CO ₂ Marine Transportation: An Energy & Techno-Economic Analysis.....	2855
<i>Eduardo Pérez-Bódalo, Rafael D'Amore-Domenech, Teresa J. Leo</i>	
Possible Circular Use of CO ₂ Waste Streams from Geothermal Power Plants.....	2866
<i>Alessia Manfredi, Giampaolo Manfreda, Valentina Veltroni, Claudio Zuffi</i>	
Multi-Criteria Optimisation to Align Environmental Impacts of Industrial Heat Production with Sustainable Thresholds.....	2879
<i>Yoann Jovet, Frederic Lefevre, Alexis Laurent, Marc Clausse</i>	
Use of Residual Energy from Underground Infrastructures: Madrid – Seville Metro Station.	2891
<i>Susana Sánchez Orgaz, Javier Muñoz Antón, Marina Tadeo Cañete, Javier Rodríguez Martín</i>	
Comparative Study of Oxygen Separation Using Cryogenic and Membrane Techniques for nCO ₂ PP	2903
<i>Maja Kaszuba, Pawel Ziolkowski, Dariusz Mikielawicz</i>	
Thermoeconomic Modeling as a Tool for Internalizing Carbon Credits into Thermal System Analysis.....	2915
<i>Igor Chaves Belisario, Pedro Rosseto De Faria, Rodrigo Guedes Dos Santos, Marcelo Aiolfi Barone, José Joaquim Conceição Soares Santos</i>	

Utilisation of Groundwater Heat Pumps for the Decarbonisation of Heating and Cooling Sector: The Analysis of an Italian Case Study.....	2927
<i>Luca Socci, Claudio Zuffi, Irene Aiello, Andrea Rocchetti, Daniele Fiaschi</i>	
How Far Should the UK Go with Negative Emission Technologies?	2939
<i>Semra Bakkaloglu, Matthias Mersch, Nixon Sunny, Christos Markides, Nilay Shah, Adam Hawkes</i>	
Evaluating the Value of Photovoltaics in Decarbonization Scenarios: Evidence from the Lombardy Region	2950
<i>Francesco Mezzera, Giuseppe Muliere, Marianna Pozzi, Fabrizio Fattori, Lorenzo Aurelio Casseti, Mario Motta</i>	
Environmental Life Cycle Assessment of a Hydropower Plant in Bolivia.....	2958
<i>Angelica Magne, Pablo Jimenez, Evelyn Cardozo</i>	
A New Approach for the Hourly Calculation of CO ₂ Emission Factors of the Thermal Energy Production in District Heating Systems.....	2969
<i>Giulia Montanari, Chiara Monzani, Alberto Poggio, Giulio Abidin Cerino</i>	
Coupling System Dynamics Model and Multi-Criteria Analysis for a Sustainability Assessment of a District Heating System's Development	2981
<i>Jelena Ziemele, Janis Edmunds Daugavietis</i>	
Life Cycle Assessment and Scenario Analyses of an Operating Geothermal Heat Project in the Southern German Molasse Basin	2992
<i>Hannah Uhrmann, Florian Heberle, Dieter Brüggemann</i>	
Implementation of Chemical Looping Combustion Technology with Waste-Derived Fuels: Process Analysis and Comparison with Other Prominent CO ₂ Capture Technologies.....	3002
<i>Konstantinos Atonios, Stella Theodoraki, Dimosthenis Plakias, Panagiotis Grammelis, Sotirios Karellas</i>	
Dynamic Life Cycle Sustainability Assessment of Mini-Grids: A Proof-Of-Concept.....	3013
<i>Omkar Buwa, Jayendran Venkateswaran, Anand B. Rao</i>	
Trade-Off Between Embodied and Operational Carbon Emissions of Residential Buildings in Early Design Stage.....	3025
<i>Yijun Zhou, Vivian Tam, Khoa N. Le</i>	
A Tool for the Development of Competencies in Sustainability and Carbon Footprint Reduction in Schools	3035
<i>Israel Marqués Valderrama, Ricardo Chacartegui Ramirez, Jose Antonio Becerra Villanueva, Yolanda Lechón Pérez, Antonio José Serrano Jiménez, Susana Marta Lopes Almeida, Carmen Díaz López</i>	

O. ENERGY, MATERIALS, WASTE AND WATER: RESOURCES AND FOOTPRINTS.

Energy Cost and Carbon Footprint of Metals. Implications for PV-Silicon Panels.....	3047
<i>Jorge Torrubia Torralba, Alicia Valero, Antonio Valero</i>	
Modeling of Thermal Conductivity of Concrete by Using Artificial Neural Networks Approaches.....	3059
<i>Ana Carolina Rosa, Youssef Elomari, Alejandro Calderón Díaz, Carles Mateu, Assed Haddad, Dieter Boer</i>	

Conductivity Analysis of Asymmetric Polysulfone Membranes for CO ₂	3070
<i>Amparo Ribes Greus, Borja Pascual-José, Alireza Zare, Alberto Puga, Jose Antonio Reina, Marta Giamberini, Amparo Ribes-Greus</i>	
A New Way to Assess the Loss of Mineral Wealth: The Case of Copper.....	3080
<i>Jose Luis Palacios, Alicia Valero, Óscar Restrepo, Fabricio Pazmiño</i>	
Water Saving in Electric Power Generation Facilities Using the Hygroscopic Cycle in the Subtropical Climate.....	3090
<i>Roberto Martínez-Pérez, Juan Carlos Ríos-Fernández, Víctor Manuel Fernández-Pacheco, Andrés Meana-Fernández, Francisco Javier Rubio-Serrano, Antonio José Gutiérrez-Trashorras</i>	
Exergy Cost Associated with Polymers Recycling in Vehicles: From Qualitative to Quantitative Indicators.....	3099
<i>Sofia Russo, Alicia Valero, Abel Ortego, Marta Iglesias-émbil, Ricardo Magdalena</i>	
Magnetic Recoverable Ag ₃ PO ₄ /Fe ₃ O ₄ /γ-Fe ₂ O ₃ Nanocomposite.....	3111
<i>Jenifer Vaswani Reboso, Dunia Esther Santiago García, José Jaime Sadhwani Alonso</i>	

P. DIGITALIZATION, BIG DATA, ARTIFICIAL INTELLIGENCE IN THE ENERGY SECTOR.

Application of Machine Learning in Energy Systems – a Comparative Analysis of Three Case Studies.....	3120
<i>Rath Michael, Gunturu Venkata Naga Lokesh, George Kiran, Prince Jayares</i>	
Reinforcement Learning for Joint Design and Control of Battery-PV Systems.....	3131
<i>Marine Cauz, Adrien Bolland, Bardhyl Miftari, Lionel Perret, Nicolas Wyrsh, Christophe Ballif</i>	
A Novel Deep Learning-Based Technique for Smart Control of Heat Pumps Integrated into Solar District Heating Systems.....	3143
<i>Dieter Boer, Youssef Elomari, Carles Mateu, Marc Marin-Genescà, Dieter Boer</i>	
Benchmarking of State-Of-The-Art Machine Learning Methods for Highly Accurate Thermal Load Forecasting in District Heating Networks.....	3154
<i>Christian Pressa, Leiprecht Stefan, Behrens Fabian, Jetzinger Verena, Popma Hendric, Finkenrath Matthias</i>	
Envisioning a Collaborative Energy System Planning Platform for the Energy Transition at the District Level.....	3163
<i>Lennart Lahrs, Pierre Pasqual Krisam, Ulf Herrmann</i>	
Artificial Intelligence (AI) Based Predictive Maintenance of Waste Heat Recovery System.....	3171
<i>Alessio Tafone, Sundar Raj Thangavelu, Imantha Gunasekera, Morita Shigenori</i>	
Evaluation of Graph Neural Networks as Surrogate Model for District Heating Networks Simulation.....	3182
<i>Taha Boussaid, François Rousset, Vasile-Marian Scuturici, Marc Clausse</i>	
Machine-Learning Based Approximation of the Hierarchical Model Predictive Control of Multi-Use PV-Battery Systems in Non-Residential Buildings.....	3194
<i>Laura Maier, Sönke Quast, Dominik Hering, Dirk Müller</i>	

Clustering and Typification of Urban Districts for Energy System Modelling	3206
<i>Joseph Loustau, Dorsan Lepour, Cédric Terrier, François Maréchal</i>	
Enabling Reinforcement Learning for Flexible Energy Systems Through Transfer Learning on a Digital Twin Platform.....	3218
<i>Carlotta Tubeuf, Felix Birkelbach, Anton Maly, Maximilian Krause, René Hofmann</i>	
BIM2SIM for Hydraulic-Focussed Energy Simulations – Automatic Generation of Pre Parametrized Simulation Models.....	3229
<i>David Jansen, Dominik Hering, Dirk Müller</i>	
LLEC Energy Dashboard Suite: User Engagement for Energy-Efficient Behavior Using Dashboards and Gamification	3241
<i>Eziama Ubachukwu, Jana Pick, Lea Riebesel, Paul Lieberenz, Philipp Althaus, Dirk Müller, André Xhonneux</i>	
Towards Rule Extraction for Sector-Coupled Energy Systems Based on Optimization Models.....	3253
<i>David Wackerbauer, Thomas Schreiber, Dirk Müller</i>	
Model Predictive Control with Self-Learning Capability for Automated Demand Response in Buildings	3263
<i>Laura Zabala Urrutia, Jesus Febres Pascual, Estibaliz Pérez Iribarren, Raymond Sterling, Iker González Pino</i>	
Transfer Learning Mechanism to Account Performance Degradation in Gas Turbines with Limited Operational Data.....	3275
<i>Sundar Raj Thangavelu, Imantha Gunasekera, Alessio Tafone, Shigenori Morita</i>	
Detection of Anomalous Energy Consumption in Commercial Activities Through Clustering Techniques.....	3284
<i>Lorenzo Ferrari, Alessandra Ghilardi, Guido Francesco Frate, Francesca Leonetti, Lorenzo Ferrari, Nicola Fredducci, Luca Brancolini</i>	
Online Model-Based Framework for Operation and Fouling Monitoring in a Large-Scale Heat Pump.....	3296
<i>Jose Joaquin Aguilera, Wiebke Meesenburg, Wiebke Brix Markussen, Benjamin Zühlsdorf, Brian Elmegaard</i>	
Data-Driven Tool for Early Building Energy Performance Diagnostic	3307
<i>Noelia Vicente Gómez, Iñigo López, Olaia Eguarte, Antonio Garrido-Marijuan, Ander Romero</i>	

Q. SMART GRIDS AND RENEWABLES INTEGRATION. DISTRIBUTED GENERATION.

Impact of Size Optimisation on the Multi-Criteria Assessment of Local Cross-Sectoral Energy Supply Concepts.....	3315
<i>Jana Schneeloch, Mohamed Eldakadosi</i>	
Vehicle-To-Grid Coupled Photovoltaic Optimization for Singapore at a District Resolution	3327
<i>Dominic Caviezel, Christoph Waibel, Markus Schläpfer, Arno Schlueter</i>	
Quantifying Operational Flexibility of Distributed Cross-Sectoral Energy Systems for the Integration of Volatile Renewable Electricity Generation	3339
<i>Sebastian Berg, Lasse Blaume, Benedikt Nilges</i>	

Towards the Introduction of Green Hydrogen in the Energy Mix of Mediterranean Islands Through the Integration of Wind and Solar Power: A Techno-Economic Case Study	3351
<i>Francesco Superchi, Sander Schepers, Antonis Moustakis, George Pechivanoglou, Alessandro Bianchini</i>	
Integrated Design and Operation Optimization of Multi-Energy Systems Including Energy Networks	3362
<i>Enrico Dal Cin, Gianluca Carraro, Andrea Lazzaretto, George Tsatsaronis, Gabriele Volpato, Piero Danieli</i>	
Smart Management for Integrated Energy Systems: Tools from Communities to Regions	3374
<i>Costanza Saletti, Mirko Morini, Agostino Gambarotta</i>	
Different Allocation Mechanisms to Distribute the Total Profits of the Italian Renewable Energy Community	3386
<i>Gabriele Volpato, Gianluca Carraro</i>	
From Local Energy Communities Towards National Energy System: A Grid-Aware Techno-Economic Analysis	3397
<i>Cédric Terrier, Joseph Loustau, François Maréchal</i>	
Detailed Modeling Framework for Integrated Photovoltaic in Partial Shading Conditions	3409
<i>Justin McCarty, Christoph Waibel, Arno Schlueter</i>	
Evaluation of Energy Sharing on a Local Energy Market Through Comparison of Energy Management Techniques	3421
<i>Joel Schölzel, Sarah Henn, Rita Streblov, Dirk Müller</i>	
Sensitivity Analysis of the Power Demand Uncertainties on the Electrical Power System Optimization Models	3432
<i>Sara Fakh, Mohamed Tahar Mabrouk, Mireille Batton-Hubert, Bruno Lacarrière</i>	
Multi-Objective Design Optimization of a Polygeneration System in Tropical Climates - A Techno-Economic Comparison Between Different Configurations	3444
<i>Alessio Tafone, Sundar Raj Thangavelu, Alessandro Romagnoli, Morita Shigenori</i>	
Quantifying Demand Flexibilities of Buildings for an Optimal Design and Operation of Integrated District Energy Systems	3457
<i>Kai Niklas George, Michael Rath, Rolf Bracke</i>	
Concept of Cold Generation in a District Heating Substation by Using Adsorption Heat Pumps Supported by Heat and Cold Storage Units	3469
<i>Wojciech Bujalski, Arkadiusz Szczesniak, Kamil Futyma, Andrzej Grzebielec</i>	

Author Index