Proceedings of the 29th International Conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems

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Foreword

It is with great pleasure that we welcome you to the 29th International Conference ECOS2016, which is being held in the pleasant Mediterranean environment of Portorož, a coastal town in Slovenia.

ECOS2016 continues the tradition of bringing together scientists, engineers and professionals as an outstanding international community of experts in the domain of energy. Here, the essential fields of energy efficiency, cost, optimization, simulation and environmental impacts are merged into a comprehensive conference program and proceedings.

We are very pleased that the ECOS conference is being held this year in Slovenia, and organized by the Faculty of Mechanical Engineering of the University of Ljubljana. This year is the 60th anniversary of the first use of the word “exergy”, as published in the Journal of Mechanical Engineering by a professor in our faculty, prof. dr. Zoran Rant.

The exergy concept for the investigation of thermodynamic processes in line with the Second Law of Thermodynamics was initially not well accepted. Twenty years later, researchers in the field of thermodynamics had recognized its importance and the real value of such an approach. One of the basic conclusions of Rant was: “The price of heat based on enthalpy is basically incorrect. Instead, one should introduce the usage of exergy. The consequence of such an approach will lead to an increase in the price of electricity and a decrease in the price of heat.” This important fact, which clearly leads to the rational use of exergy, is not broadly applied in today's practice, such as for instance, the price of heat, defined on the basis of exergy. Today, only the enthalpy difference, despite it being incorrect, still plays a major role in the invoices that consumers receive. Therefore, we have decided to pay tribute to prof. Rant with a plenary lecture on his life and work, which has been prepared by prof. Tuma, his last graduate student.

This year we have the wonderful opportunity to host prof. Osamu Motojima, a leading expert in the field of fusion energy and the former General Director of the ITER project. He will present the role of fusion energy in the future energy mix. Moreover, his plenary lecture will bring us closer to the details of the ITER project and its progress.

An important milestone for ECOS2016 is the celebration of the 40th anniversary of the International Journal ENERGY, one of the most influential journals in the field of energy. This is a special recognition of the excellent collaborations in the ECOS community, as well as the trust in the ECOS2016 Organizing Committee.

We would like to express our gratitude to the ECOS Scientific Committee and especially its distinguished members, Tatiana Morosuk, the invited Conference Chair, and Noam Lior and George Tsatsaronis, as Honorary Chairs. Our gratitude also goes to the numerous topic leaders and reviewers, who made great efforts to produce these proceedings with 262 high-quality papers.

The conference would not be possible without all the excellent papers contributed by the authors, as well as by the outstanding plenary and keynote lectures. We would like to thank all the authors for their contributions and their participation at ECOS2016. Finally, we must thank all the industrial partners and sponsors who supported the conference and helped maintain the conference’s highest standards.

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Carlos Oliveira, Pedro Pinheiro, Ângela Silva, Ana Cristina Ferreira, Cecília Martins
Energy use and CO$_2$ emissions of the Mexican white maize agroindustry
Sergio Juárez-Hernández, Claudia Sheinbaum Pardo

Energy efficiency improvement potentials of pulp and paper sector through energy benchmarking and cogeneration
Imran Shabbir, Mojtaba Mirzaeian, Jim Mooney, Farhad Anvari

Energy strategy programs in Canton of Vaud of Switzerland: Specific actions
Nasibeh Pouransari, Soizic Dubois, Céline Pahud, Mohamed Meghari

How to Explore and Analyze the Decision Space in the Synthesis of Energy Supply Systems
Maike Hennen, Matthias Lampe, Philip Voll, André Bardow

Integration of Renewable energy sources and Forecast of development of electricity consumption in the Slovenian transmission network till 2050
Uroš Stritih, Vincenc Butala, Andrej Senegačnik, Mihael Sekavcnik, Samuel Rodman Oprešnik, Štefan Ivanjko

Local community as the pillar of developing a sustainable energy strategy
Amer Karabegović

Optimal use of biomass in large-scale energy systems: insights for energy policy
Víctor Codina Gironès, Stefano Moret, Emanuela Peduzzi, Marco Nasato, François Maréchal

Power plant flexibility and the value of flexibility in power systems with high shares of variable renewables: a scenario outlook for Germany in 2035
Jakob Kopiske, Sebastian Spieker and George Tsatsaronis

Techno-economic evaluation of self-consumption with PV/battery systems under different regulation schemes
Sylvain Quoilin, Andreas Zucker

The information platform energyscope.ch on the energy transition scenarios
Daniel Favrat, François Vuille, François Marechal, Victor Codina

Waking the sleeping giant – deriving a strategy for dynamic renewable heat markets in Germany
Georg Wagener-Lohse, Gabriele Harrer-Puchner, Ulf Sieberg

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**Energy Storage (thermal, electric, hydrogen, alternatives)**

A modeling and simulation approach for thermal energy storage devices
Elie Terzibachian, Brice Tremeac, Christophe Marvillet, Philippe Esparcieux

Active PCM cold storage in off grid telecommunication base stations: potential assessment of primary energy savings
Alexander Studniorz, Daniel Wolf, Andreas Christidis, George Tsatsaronis

Adiabatic compressed air energy storage - a study on dynamic performance with sensible and latent thermal storage
Adriano Sciacovelli, Yongliang Li, Yulong Ding

An optimization algorithm for load-shifting of large sets of electric hot water tanks
Nathanael Beeker, Paul Malisani, Nicolas Petit
Comparative energy and exergy analysis of compressed air and liquid air energy storage systems
Piotr Krawczyk, Lukasz Szablowski, Sotirios Karellas, Emmanuel Kakaras, Krzysztof Badyda

Economic and energy analysis of a Thermal Energy Storage power system
Alberto Benato, Alex Pezzuolo, Anna Stoppato, Alberto Mirandola

Evaluation of cryogenics-based energy storage concepts
Sarah Hamdy, Tatiana Morosuk, George Tsatsaronis

Exergoeconomic analysis and optimization of a novel isobaric adiabatic compressed air energy storage system
Youssef Mazloum, Haytham Sayah, Maroun Nemer

Liquid air energy storage – operation and performance of the first pilot plant in the world
Adriano Sciacovelli, Daniel Smith, Helena Navarro, Yongliang Li, Yulong Ding

Time-dependent performance of an integrated solar-driven hydrogen generation device
Ligang Wang, Daniel Gregory, Raluca-Anruta Suciu, François Maréchal

Numerical investigation of a continuous thermochemical heat storage reactor
Lauren Farcoat, Benoit Michel, Nolwenn Le Pierrès, Philippe Papillon

Performance Analysis of Adiabatic Compressed Air Heat storage and Solar Hybrid System
Wenyi Liu, Xiaozeng Man, Angjun Xie, Chenwei Niu, Gang Xu, Qing Li

Simulation of a heat tank with Phase Change Materials (PCM)
Tzivanidis Christos, Sagia Zoi, John Alexopoulos

Simulation of cogeneration combined cycle plant flexibilization by thermochemical energy storage
Michael Angerer, Michael Djukow, Dr.-Ing. Karsten Riedl, Dr.-Ing. Stephan Gleis, Prof. Dr.-Ing. Hartmut Spliethoff

Small-scale Pumped Heat Electricity Storage for decentralised combined Heat and Power Generation: cost optimal Design and Operation
Annelies Vandersickel, Amir Aboueldahab, Hartmut Spliethoff

Systematic Thermal Energy Storage Integration in Industry Using Pinch Analysis
Donald Olsen, Yasmina Abdelouadoud, Beat Wellig, Pierre Krummenacher

Techno-economic optimization of isolate micro-grids including PV and Li-Ion Batteries in the Bolivian context
Sergio Balderrama, Walter Canedo, Miguel Fernandez, Vincent Lemort, Sylvain Quoilin

Thermodynamic analysis of a thermochemical storage process using a multisalt open fixed bed reactor
Benoit Michel, Lauren Farcoat, Nolwenn Le Pierrès

Engines, furnaces & boilers, combustion/gasification

A lumped thermodynamic model of gas turbine blade cooling: prediction of first-stage blades temperature and cooling flow rates
Roberta Masci, Enrico Sciubba

Quasi-dimensional model of an optically accessible spark ignition engine
Paolo Gobbato, Nicola Saccon and Adrian Irimescu
Design and CFD analysis of a Curtis turbine stage
Manuele Achille, Simone Cardarelli, Fabio Pantano, Massimiliano Zito

DESIGN AND CFD ANALYSIS OF AN ODONTOIATRIC TURBINE
Gianluca Califano, Andrea Notari, Silvia Scorza and Manuel Tommasi

Dynamics of wet flue gas desulfurization in spray absorber
M. M. Petrovic, V. D. Stevanovic, S. Jankovic, S. Milivojevic

Numerical model of an externally fired gas turbine, including an arbitrary number of stages in expansion and compression processes
Álvaro Durante, Gabriel Pena-Vergara, Pedro Curto-Risso, Alejandro Medina, Antonio Calvo Hernández

Optimization of a syngas purification line and CO₂ capture systems integrated with a small-scale up-draft gasifier
Giorgio Cau, Vittorio Tola, Enrico Maggio

Optimizing the efficiency of an externally fired gas turbine
Álvaro Durante, Gabriel Pena-Vergara, Pedro Curto-Risso, Martín Pedemonte, Pablo Ezzatti

Process simulation of an air cooled gas turbine blade
Alfonso Biondi, Francesca Palomba, Berardino Ricci

SET-UP OF A ROBUST NARX MODEL SIMULATOR OF GAS TURBINE START-UP
Hilal Bahlawan, Mirko Morini, Michele Pinelli, Pier Ruggero Spina, Mauro Venturini

Techno-economic optimisation of three gas liquefaction processes for small-scale applications
Tuong-Van Nguyen, Erasmus Damgaard Rothuizen, Brian Elmegaard, Allan H. Bruun

The Impact of Air Quality and Site Selection on Gas Turbine Engine Performance
David MacPhee, Asfaw Beyene,

Thermodynamic Approach To Assess Premixed Spherical Flame Propagation: Calculation of Laminar Flame Speed, Radius Profile and Exergy Destruction Using Experimental Pressure Traces as Input
Ricardo Morel Hartmann, Edimilson Jesus de Oliveira, Edson Bazzo, Mauro Iurk Rocha, Amir A. M. Oliveira

Thermodynamic assessment of an integrated mild oxyfuel combustion power plant – preliminary study
Paweł Gładysz, Wojciech Stanek and Lucyna Czarnowska

Wall temperature and system mass effects in a reciprocating gas spring
Aly I. Taleb, Paul Sapin, Christoph Barfuss, Alexander J. White, Dražen Fabris, Christos N. Markides

Environmental, social and sustainability issues associated with energy systems, industrial production, and transportation

A cross-country assessment of energy-related CO₂ emissions: A combined decomposition and decoupling approach
Fátima Lima, Manuel Lopes Nunes, Jorge Cunha

Benefits of Integrating Geographically Distributed District Heating Systems
D.F. Dominković, I. Bačeković, D. Sveinbjörnsson, A.S. Pedersen and G. Krajačić

Comparing Lean-Green models for eco-efficient production
M. Florentina Abreu, Anabela C. Alves, Francisco Moreira
Assessing Direct and Embodied energy trades among national economies through Input-Output Analysis
Matteo Vincenzo Rocco, Claudia Pavarini, Emanuela Colombo

Environmental and exergetic sustainability assessment of power generation from biomass
Lydia Stougie, Georgios-Archimidis Tsalidis, Hedzer van der Kooi, Gijsbert Korevaar

Environmental Impact by Hydrogeothermal Energy Generation in Low-Enthalpy Regions
Christiane Lohse

Potential Environmental Impacts of Hydraulic and Chemical Stimulations in Deep Geothermal Wells – a German Perspective
Andreas Bertram, Christian Bönnemann, Lars Ceranna, Nicolai Gestermann, Georg Houben, Thomas Plenefisch, Torsten Tischner, Ulrich Wegler

ENVIRONMENTAL, ECONOMIC AND TECHNICAL ASSESSMENT OF RUBBER BLENDS WITH MULTI-CRITERIA ANALYSIS
Petar S. Đekić, Goran Radenković, Biljana Milutinović, Gordana Stefanović

Establishing the Local Emission Standard Level: the Case of Assaluyeh
Hossein Khajehpour, Yadollah Saboohi, George Tsatsaronis

LIFE CYCLE ASSESSMENT OF WASTE MANAGEMENT SCENARIOS WITH ENERGY RECOVERY USING MULTI-CRITERIA ANALYSIS
Biljana Milutinović, Gordana Stefanović, Petar S. Đekić, Ivan Mijailović

Environmental impacts of electricity production of micro wind turbines with vertical axis
Lidia Lombardi, Ennio Carnevale, Barbara Mendecka, Giulio Santoni, Wojciech Stanek

Cost Allocation strategy for off grid system in rural area: a case study on irrigation for rural agricultural lands in India
Giorgio Bonamini, Fabio Riva, Emanuela Colombo

Exergy based methods and thermo-economic analysis & optimization

A New Approach for Applying Dynamic Exergy Analysis and Exergoeconomics to a Building Envelope
Saeed Sayadi, George Tsatsaronis, Tatiana Morosuk

Allocation of waste and resources in multiproduct plants: thermoeconomics and LCA
Julio Augusto Mendes da Silva, José Joaquim Conceição SoaresSantos, Monica Carvalho, Silvio de Oliveira Jr.

A CRITICAL REASSESSMENT OF THE HESS-MURRAY LAW
Enrico Sciubba

Application of the Mixed Integer Linearized Exergoeconomic (MILE) method with evolutionary optimization to a cogeneration and district heating system
Mauro Reini, Piero Pinamonti, Stefano Costanzo, Melchiorre Casisi

Bio-products: A new way to calculate fossil fuels in the grave to cradle exergy assessment
Kai Whiting, Luis Gabriel Carmona, Tânia Sousa

Application of exergoeconomic, exergoenvironmental and advanced exergy analyses on Carbon Black production
Pieter Mengenthaler, Arndt-Peter Schinkel, George Tsatsaronis

Comparative exergoeconomic evaluation of two modern combined-cycle power plants
Marwan Assar, Timo Blumberg, Tatiana Morosuk, George Tsatsaronis
Energy, Exergy and Advanced Exergy Analysis of a Milk Processing Factory
Fabian Bühler, Tuong-Van Nguyen, Jonas Kjær Jensen, Brian Elmegaard

Exergetic analysis of stillage concentration
Fukushima, N A, Palacios-Bereche R, Nebra SA

Exergetic and exergoeconomic evaluation of a SOFC/engine hybrid power generation system
Young Duk Lee, Kook Young Ahn, Tatiana Morosuk, George Tsatsaronis

Exergoeconomic analysis applied to the process of regasification of LNG integrated into an air separation process
Stefanie Tesch, George Tsatsaronis, Tatiana Morosuk

Exergo Economic Analysis-Based Criteria for Competitiveness of Hybrid Power Cycles using Multiple Heat Sources of Different Temperatures
Ting Yue, Noam Lior

EXERGY ANALYSIS APPLIED TO THE HEATING PROCESS OF AVIARIES FOR BROILER PRODUCTION IN BRAZIL
Alencar Migliavacca, Silvio de Oliveira Junior, Jurandir Itizo Yanagihara

Exergy analysis with variable ambient conditions
Mauro Reini, Melchiorre Casisi

Exergy Analysis of the Compression Systems and its Prime Movers for a FPSO Unit
Waldyr L. R. Gallo, Antonio G. Gallego, Víctor L. Acevedo, Rodrigo Dias, Hamilton Y. Ortiz, Bruno A. Valente

Exergy destroyed in the arteries due to stenosis
Izabela Batista Henriques, Carlos Eduardo Keutenedjian Mady, Jose María Marín, Luis María Serra, Silvio de Oliveira Junior

Exergy dynamics of a sphere undergoing a non-equilibrium concentration transient
Enrico Sciubba, Federico Zullo

Exergo-economic evaluation of a CSP plant in combination with a desalination unit
Bernhild Meyer-Kahlen, Johannes Wellmann, Tatiana Morosuk

Extended Exergoenvironmental Method as a Tool for Environmental Responsibility -- Accounting in Complex Energy Systems
Hossein Khajeh Pour, Yadollah Saboohi, George Tsatsaronis

Finite-time thermoeconomic optimization of a non-endoreversible Novikov power plant model under different regimes of performance with Dulong-Petit's heat transfer law
J. C. Pacheco-Páez, Marco A. Barranco-Jiménez, F. Angulo-Brown

Improving the accuracy of the results of exergy analysis and exergoeconomics evaluation for the complex energy system using the CFD technique
Goran Vučković, Mirko Stojiljković, Mića Vukić, Pavel Trubaev, Marko Ignjatović

Thermoeconomic analysis of a cement production plant
Alicia Valero, Alejandro Abadías
Fuel cells

Andrej Lotrič, Mihael Sekavčnik, Andrej Pohar, Blaž Likozar, Stanko Hočevar

Influence of talc dust impurities in the MCFC cathode inlet gas mixture
Jarek Milewski, Rafal Bernat

Multi-objective Optimization of Solid Oxide Fuel Cell–Gas Turbine Hybrid Cycle and Uncertainty Analysis
Shivom Sharma, Celebi Ayse Dilan, Emanuela Peduzzi, François Maréchal, Adriano V. Ensinas

LCA study of the Fuel Cell based UPS in manufacturing and operational phase
Mitja Mori, Grega Štern

Heat & mass transfer, fluid dynamics

A simpler finite element method for the flux density distribution of a parabolic trough concentrator
Jifeng Song, Kai Tong, Zili Zhou

CFD modelling to aid the design of steel sheet multistage pumps
Federico Fontana, Massimo Masi

Experimental and Numerical Investigation of Thermal and Fluid Flow Processes in a Matrix Heat Exchanger
Mladen Tomic, Predrag Živković, Biljana Milutinović, Mića Vukić, Aleksandra Boričić

Fluid dynamics assessment of tesla turbine rotor
Giampaolo Manfrida, Lorenzo Talluri

Microfluidic in-chip temperature control via heat of mixing release
Giacomo Bonciolini, Andrew J. Demello, Enrico Sciubba, Daniele Vigolo

New approach for transient simulation of closed batch evaporation in a plate heat exchanger
Moritz Gleinser, Christoph Wieland, Hartmut Spliethoff

Performance study of a fin and tube heat exchanger with different fin geometry
Shobhana Singh, Kim Sørensen, Thomas J. Condra

Simulation of a Heat Exchanger
Tzivanidis Christos, Sagia Zoi, Alexopoulos John

Thermal analysis of an entire Flat Plate Collector with a Serpentine flow system and determination of the water and air flow and convection regime
D. Korres, C. Tzivanidis

Nonbiomass RENEWABLE thermal systems

A one year performance comparison of transparent and unglazed transpired collectors
Laura Guillon, Stéphane Hallé, Daniel R. Rousse
Experimental validation of a 3-D dynamic solarthermal collector model under time-varying environmental conditions
Ilaria Guarracino, James Freeman, Christos N. Markides

Nanofluids application in direct absorption solar collectors: review and numerical model
Simone Dugaria, Matteo Bortolato, Davide Del Col

Optical and thermal analysis of a new U-type Evacuated Tube Collector with a Mini-Compound Parabolic Concentrator and a cylindrical absorber
D. Korres, C. Tzivanidis

Towards optimal design of solar assisted industrial processes: Case study of a dairy
A.S. Wallerand, R. Voillat, F. Maréchal

Thermodynamic performances on typical days of a steam generation system with a solar assisted absorption heat transformer
Feng Liu, Jun Sui, Hongguang Jin

**ORC**

A novel scroll expander for flank leakage investigation: preliminary tests
Gabriel Rossi Fanti, and Gustavo Henrique Bolognesi Donato, Paulo Eduardo Batista de Mello

A thermodynamic feasibility study of an Organic Rankine Cycle (ORC) for Heavy Duty Diesel Engine (HDDE) waste heat recovery in off-highway applications
Simone Lion, Constantine N. Michos, Ioannis Vlaskos and Rodolfo Taccani

Turgay Koroglu, Oguz Salim Sogut

Deep water cooled ORC for floating oil platform applications
Caio Gracco Fonseca do Val, Julio Augusto Mendes da Silva, Silvio de Oliveira Junior

**DESIGN AND CFD ANALYSIS OF A LJUNGSTRÖM TURBINE FOR AN ORC CYCLE IN A WASTE HEAT RECOVERY APPLICATION**
Carlo Francesco Palumbo, Valerio Francesco Barnabei, Eugenio Preziuso, Umberto Coronetta

Design Challenges of Low Grade Heat Recovery ORCs for Low Power Output: Experiences from a Prototype Design
Andrey Elgin, Asfaw Beyene

Development of a semi-analytical model of volumetric expander for system-level simulation
Jean-François Oudkerk, Rémi Dickes, Vincent Lemort

**ENERGY PERFORMANCE AND ECONOMIC EVALUATION OF HEAT PUMP/ORGANIC RANKINE CYCLE SYSTEM WITH SENSIBLE THERMAL STORAGE**
C. Carmo, O. Dumont, M.P. Nielsen, B. Elmegaard

Flexible two-stage turbine bleeding Organic Rankine Cycles (ORCs) for combined heat and power applications
Dominik Meinel, Konstantinos Braimakis, Christoph Wieland, Sotirios Karellas, Hartmut Spliethoff
Multiple expansion ORC for small scale – low temperature heat recovery
Diego Micheli, Mauro Reini, Rodolfo Taccani

ORCmKit: an open-source library for organic Rankine cycle modeling and analysis
Rémi Dickes, Davide Ziviani, Michel De Paepe, Martijn Van den Broek, Sylvain Quoilin, Vincent Lemort

Organic Rankine cycle modeling and the ORCmKit library: analysis of R1234ze(Z) as drop-in working fluid replacement of R245fa for low-grade waste heat recovery
Davide Ziviani, Rémi Dickes, Sylvain Quoilin, Vincent Lemort, Michel De Paepe, Martijn van den Broek

Performance comparison between single and dual pressure Organic Rankine Cycle systems
Eleonora Bonamico, Giovanni Manente, Andrea Lazzaretto

Performance evaluation of an Organic Rankine Cycle (ORC) connected to two-phase closed thermosyphons
Van Long Lê, Sébastien Declaye, Xavier Dumas, Ludovic Ferrand and Vincent Lemort

Performance of working-fluid mixtures in an ORC-CHP system for waste-heat recovery
Oyeniyi A. Oyewunmi, Christoph J.W. Kirmse, Christos N. Markides

Recovering gas turbine high-temperature exhaust heat using organic Rankine cycle with mixture as working fluid
Alex Pezzuolo, Alberto Benato, Anna Stoppato, Alberto Miranda

Steady-state and dynamic modeling of a 1 MWel commercial waste heat recovery ORC power plant
George Andritsos, Adriano Desideri, Clément Gantiez, Vincent Lemort, Sylvain Quoilin

Technical and economic optimization of an organic Rankine cycle dedicated to the production of electricity from a geothermal source using a genetic algorithm
Stephane Schuller, Christophe Josset, Bruno Auvity, Jérôme Belletre

Thermal decline mitigation in a geothermal plant by hybridization with a concentrating solar power system
Martina Ciani Bassetti, Fabrizio Bizzarri, Daniele Consoli, Orlando Tari, Giovanni Manente, Andrea Lazzaretto

Thermodynamic and technical criteria for the optimal selection of the working fluid in a mini-ORC
Benjamin Franchetti, Apostolos Pesiridis, Ioannis Pesmazoglou, Enrico Sciubba, Lorenzo Tocci

Optimal part-load operation of an 11 kWe organic Rankine cycle for waste heat recovery
Steven Lecompte, Martijn van den Broek, Michel De Paepe

Power generation and CHP with fossil fuels and nuclear

A Practical Approach to Optimizing the Operation of Three Units at Power Plant Ljubljana
Igor Kuštrin, Andrej Senegačnik, Igor Bole

Dynamic simulation of a 550MWel coal fired power plant for extended secondary control power output
Julia Hentschel, M.Sc., Dr.-Ing. Henning Zindler, Prof. Dr.-Ing. Hartmut Spliethoff

Increasing the Flexibility of Combined Heat and Power Plants with Heat Pumps and Thermal Energy Storage
Eike Mollenhauer, Andreas Christidis, George Tsatsaronis
Investigation of an ammonia-water combined power and cooling system driven by jacket water and exhaust gas heat of internal combustion engine
Yi Chen, Wei Han, Hongguang Jin

Modern design concepts for thermal power generation towards highest efficiency, increased utilization and reduced carbon footprint
Christian Bergins, Michalis Agraniotis, Małgorzata Stein-Brzozowska, Torsten Buddenberg, Emmanouil Kakaras

Multi-objective superstructure-free synthesis and optimization of thermal power plants
Ligang Wang, Matthias Lampe, Philip Voll, Yongping Yang, André Bardow

NOx reduction and efficiency improvement of a 210 MWt coal-fired boiler co-firing biomass
Jure Smrekar, Andrej Sarjaš, Primož Gostinčar, Marjan Hočevar

Performance Analysis of a Steam Power plant with district heating
Turgay Koroglu, A. Sinan Karakurt, Ümit Güneş

Performance study of a 1000MW coal-fired power plant integrated with the tower solar energy collector system
Liqiang Duan, Shilun Jia, Xiaohui Yu, Kun Xie

Scheduling optimization of Combined Heat and Power units with multiple degrees of freedom based on the superposition principle
Aldo Bischi, Santo Lico, Tommaso Cortigiani, Giampaolo Manzolini, Paolo Silva, Emanuele Martelli

Simulation on the Flue Gas Pre-Dried Lignite-Fired Power Plants Firing High Moisture Lignite
Xiaoqu Han, Sotirios Karellass, Qiwei Mu, Ming Liu, Jiping Liu, Junjie Yan, Dimitrios Rakopoulos, Emmanuel Kakaras

Thermodynamic analysis of power generation cycles with High Temperature Gas Cooled Nuclear Reactor HTGR and Additional Coolant Heating up to 1600°C.
Michał Dudek, Zygmunt Kolenda, Marek Jaszczur, Wojciech Stanek

Power generation and CHP with RENEWABLES and WASTE

New Methodology for Computing Performance of Solar Stirling Engines with Cogeneration using Fresnel Mirrors, Developed in the Framework of Thermodynamics with Finite Speed and the Direct Method
Petrescu Stoian, Costea Monica, Petrescu S. Adrian, Borcila Bogdan, Stanciu Camelia, Popescu Gheorghe, Boriaru Nicolae and Banches Eugen

Analysis of environmental impact of wind turbines at increasing size
Lidia Lombardi, Ennio Carnevale, Barbara Mendecka, Giulio Santoni

Automated Dispatch Control System Of Thermal Solar Power Plant
Alexander Belousov, Yury Koshlich, Artyom Grebenik

Connecting individual residential hydrogen chp energy systems with renewables into different sized grids
R.Lacko, R. Stropnik, M. Mori, B. Drobnč

Energy Opportunities in a Tyre Plant
Daniel Tavares, Carlos Pinho
Feasibility analysis of an electricity, cooling and heating microgrid developed for a University Campus in Lisbon, Portugal using Combined Heat, Cooling and Power Template for manuscripts
M. Sandoval-Reyes, Monica M. Eskander, João M. Pires, Bruno Lacarrière, Carlos A. Silva

Experimental Analysis of a Flexible Bladed Horizontal Axis Wind Turbine
David MacPhee, Asfaw Beyene

Limitations of thermal power plants to solar and wind development in Brazil
Raul Miranda, Paula Ferreira, Roberto Schaeffer, Alexandre Szklo

Methodology to evaluate the viability of windfarm – cases study
Túlio C. Freitas, Diego C. R. Volpato

Modeling and Parametric Analysis of a Waste –to-Energy Facilities performance for electrical energy production
Elie Badine, Chantal Maatouk

Numerical analysis of a compression ignition engine for CHP applications powered in the dual-fuel mode with syngas and biodiesel
M. Costa, M. La Villetta, N. Massarotti, D. Piazzullo, V. Rocco

Optimal energy supply system and hourly operation plan for the TUM campus Garching using linear programming model URBS
Barbara Hetterich, Johannes Dorfner, Annelies Vandersickel, Hartmut Spliethoff

PARAMETRIC ANALYSIS OF A SOLAR THERMAL POWER PLANT WITH AN ORGANIC RANKINE CYCLE (ORC) GENERATOR
J.B. Obi, R. Taccani, D. Micheli M. Reini

Capability of a small size CSP plant to provide dispatch power
Luca Migliari, Daniele Cocco, Mario Petrollese, Giorgio Cau

Simulation and comparative Thermoeconomic analysis of Central Receiver Concentrated Solar plants using air as heat transfer fluid
Andrea Catalano, Matteo Rocco, Claudia Toro, Emanuela Colombo, Enrico Sciubba

STEADY-STATE AND TRANSIENT MODELS OF A COOLING SYSTEM FOR IMPROVING THE PERFORMANCES OF A PV FIELD
Fabio Schiro, Anna Stoppato, Nicola Destro, Alberto Benato

TECHNO-ECONOMIC ANALYSIS OF A HYBRID CSP-CPV POWER PLANT
Mario Petrollese, Daniele Cocco, Luca Migliari, Giorgio Cau

Research of lightning protection features for a wind mill by the method of tracing the lines of stream function
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Theoretical and experimental investigations on the instantaneous heat transfer in the cylinder of an Ericsson engine
Oussema Ben Sassi, Alejandro Fula, Fabio Sierra, Pascal Stouffs

Thermal-Economic Design of a Solar Dish Stirling Cogeneration System using a Multi-Objective Approach
Ana C.M. Ferreira, Manuel L. Nunes, Luís B. Martins, Senhorinha F. Teixeira, José C.F. Teixeira, Silvia A Nebra

Thermodynamic Model of a Hybrid Brayton Thermosolar Plant
R.P. Merchán, M.J. Santos, A. Medina, A. Calvo Hernández
THERMOECONOMIC ANALYSIS OF A SUGARCANE COGENERATION CYCLE BY SUBCYCLE DECOMPOSITION
Juan C. López, Miguel A. Lozano, Luis M. Serra, Eduardo A. Pina and Álvaro Restrepo

Process integration, simulation & optimization of energy systems
A preliminary analysis of floating production storage and offloading facilities with gas liquefaction processes
Tuong-Van Nguyen, Yamid Alberto Carranza-Sánchez, Silvio de Oliveira Júnior

“Composed thermodynamic rarity” of the materials in electric and electronic equipment
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Demand Response Potential in the Chemical Industry: A Review
Franziska Klaucke, Tatiana Morosuk, Frank Holtrup, George Tsatsaronis

Identification of data-driven grey-box models for energy management applications
Hassan Harb, Neven Boyanov, Thomas Schütz, Henryk Wolisz, Kristian Huchtemann, Dirk Müller

Development of Simplified Process Integration Methodologies in medium size industries
Riccardo Bergamini, Tuong-Van Nguyen, Fabian Bühler, Brian Elmegaard

Heat integration of a vinasse concentration system and juice evaporation system within a conventional sugarcane based ethanol production process
Edgar Fernando Cortes Rodriguez, Nilton Asao Fukushima, Reynaldo Palacios-Bereche, Adriano V. Ensinas, Silvia A Nebra

Performance Comparison of Energy Supply Systems Under Uncertain Energy Demands Based on a Mixed-Integer Linear Model
Ryohei Yokoyama, Ryo Nakamura, Tetsuya Wakui

Refrigeration & air conditioning, Heat pumps
Comparative Exergoeconomic Analysis of Various Transcritical R744 Commercial Refrigeration Systems
Paride Gullo, Giovanni Cortella

Comparing seasonal performance factor of different heat pump systems for residential HVAC in the Dfb climate area of Republic of Croatia
Tomislav Kurevija, Josipa Kapuralić, Marija Macenić

Design of serially connected ammonia-water hybrid absorption-compression heat pumps for district heating with the utilisation of a geothermal heat source
Jonas Kjaer Jensen, Torben Ommen, Wiebke Brix Markussen, Brian Elmegaard

Accuracy Improvement of Performance Evaluation for Variable Refrigerant Flow Systems
Emi Matsui, Shigeki Kametani, Tatsuo Nobe

Easy Advanced Control for energy efficiency applied to refrigeration
Benedicte Ballot-Miguet, Jose Blancarte, Gregoire Duhot

Efficient waste heat recovery in a cryogenic distillation air separation plant using heat pumps
Noé Demesa, Joan Carles Bruno, Alberto Coronas, Armando Huicochea
Enhanced thermal response test using fiber optics for a double u-pipe borehole heat exchanger analysed by numerical modeling
Nordin Aranzabal, Georgia Radioti, Julio Martos, Jesús Soret, Frederic Nguyen, Robert Charlier

Experimental Study of a Novel Ejector-absorption Refrigeration Cycle Driven by Multi-heat sources
Yuqi Shi, Guangming Chen, Daliang Hong, Qin Wang

Impact of borehole cement-bentonite grout’s thermal conductivities on a long-term ground-source heat pump efficiency
Tomislav Kurevija, Marija Macenić, Staša Borović

Influences on the Seasonal Performance of Heat Pump Systems Investigated Via Dynamic Simulations
Philipp Mehrfeld, Markus Nürenberg, Kristian Huchtemann, Dirk Müller

Investigation on annual energy performance of a VVW air-source heat pump system
Ruzhu Wang, Zhequan Jin, Xiaoqiang Zhai, Chengcheng Jin, Weili Luo, Trygve M. Eikevik

Mode and storage load based control of a complex building system with a geothermal field
Johannes Füttener, Gerrit Bode, Dirk Müller

Modeling of Frost Growth and Evaporation of Refrigerant Blends in a Fin-and-Tube Heat Exchanger
Elie Keryakos, Joseph Toubassy, Amlie Danlos, Denis Clodic, Georges Descombes

Operation Strategy for Heat Recovery of Transcritical CO2 Refrigeration Systems with Heat Storages
Michael Noeding, Nicolas Fidorra, Manuel Graeber, Juergen Koehler

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