

JOURNAL OF SUSTAINABLE ENERGY

www.energy-cie.ro

Editorial Board

JOURNAL OF SUSTAINABLE ENERGY EDITOR IN CHIEF

Feleea Ioan – Member of I.E.E.E.

University of Oradea, Faculty of Energy Engineering, ifelea@uoradea.ro

EDITORS

Gleb Drăgan
Member of Romanian Academy

Florin Gheorghe Filip
Member of Romanian Academy
filip@acad.ro

Cornel Antal
University of Oradea,
cantal@uoradea.ro

Anatolie Carabulea
Politehnica University of Bucharest

Gianfranco Chicco
Politecnico de Torino , Italia
gianfranco.chicco@polito.it

Roberto Cipollone(details)
University of L'Aquila
roberto.cipollone1@tin.it

Flodor Erhan
State Agricultural University, Moldova
terhan@mail.ru

Mihai Jădăneanu
Politehnica University of Timisoara
mihai.jadaneanu@mec.upt.ro

Ştefan Kilyen
Politehnica University of Timisoara
stefan.kilyen@et.upt.ro

Gheorghe Lazăraru
Politehnica University of Bucharest
glazararu@yahoo.com

Carlo Mazzetti
La Sapienza di Roma
mazzetti@elettrica.ing.univroma1.it

Jacques Padet
Université de Reims, France
jacques.padet@univ-reims.fr

Florin Popentiu
University of Oradea
popentiu@imm.dtu.dk

Kiril Popovski
Bitola University, Macedonia
kiril.popovski@ukim.edu.mk

Paulo F. Ribeiro (details)
Grand Rapids, Michigan
pribelro@calvin.edu

Marcel Roşca
University of Oradea
mrosca@uoradea.ro

Saroudis J.
AECL, CANDU Services
saroudisj@b.astral.ro

Takács János (details)
Technical University Bratislava
jan.takacs@stuba.sk

Victor Valda
University of Oradea
valda@temodeva.ro

Varju György (details)
Budapest University of Technology & Economics
varju.gyorgy@vet.bme.hu

Alexandru Vasilevici
Politehnica University of Timisoara
sandu.vasilevici@et.utt.ro

Mirela Vereş
University of Oradea
mveres@uoradea.ro

Nikolai Voropai
Energy Systems Institute, Russia
voropal@sem.sci.lnk.ru

Irena Waslak (details)
Technical University of Łódź
Irena.waslak@p.lodz.pl

Dan Zlatanovici
ICEMENERG
danz@icemenerg.ro

Gabriel Bendea
University of Oradea
gbendea@uoradea.ro

Nicolae Coroianu
University of Oradea
nicolae.coroianu@yahoo.com

Laurentiu Popper
University of Oradea
director@perfectservice.ro

Caillin Secul
University of Oradea
csecul@uoradea.ro

Zéényi Zsigmond
University of Oradea
zeenyi@rdsink.ro

EXECUTIVE STAFF

Co-editor:
Badea Gabriel
University of Oradea, gbaudea@uoradea.ro

Executive Editor:
Dziac Simona
University of Oradea, simona.dziac@gmail.com

Editorial secretary
Albut-Dana Daniel
University of Oradea, daniel@uoradea.ro

Technical Secretary
Vasile Moldovan
University of Oradea, moldovan@uoradea.ro

Editorial Activities
Barla Eva
University of Oradea, ebarla@uoradea.ro

Editorial Activities
Florin Dan
University of Oradea, florin.dan@interobiz.ro

PUBLISHER & EDITORIAL OFFICE
University of Oradea Editing House,
Str. Universității Nr. 1, Oradea, Jud. Bihor, România, Zip code: 410087, Tel.: 00-40-259-408171, Fax: 00-40-259-408404
ISSN: 2067-5538 (print version)

The Journal of Sustainable Energy (JSE) had its first appearance under this name in 2010. The history of JSE is the following: is formed in 2010 by transforming of 1993-2009 Analele Universitatii din Oradea, Fascicula de Energetica, 1224-1261. Which superseded in part (1991-1992): Analele Universitatii din Oradea, Fascicula Electrotehnica si Energetica (1221-1311); Which superseded in part (1976-1990): Lucrari Stiintifice - Institutul de Invatamant Superior Oradea, Seria A, Stiinte Tehnice, Matematica, Fizica, Chimie, Geografie (0254-8593);

The Journal of Sustainable Energy (JSE) publishes original contributions in the field of the following topics:

- Energy engineering education
- System reliability and power service quality
- Generation of electric and thermal power
- Energy policy and economics
- Energy development (solar power, renewable energy, waste-to-energy systems)
- Energy systems operation
- Energy efficiency, reducing consumption for conservation of energy
- Energy sustainability as related to energy and power production, distribution and usage
- Waste management and environmental issues
- Energy infrastructure issues (power plant safety, security of infrastructure network)
- Energetic equipments

The articles quality increases with every issue. Apart from its improved technical contents, a special care is given to its structure. The guidelines for preparing and submitting an article were modified and developed in order to meet high quality standards requirements. With every passing issue the peer-review process was developed too, being now a double-blinded [peer-review process](#).

Authors who wish to submit a manuscript to the Journal of Sustainable Energy (JSE) are kindly asked to send their manuscripts as DOC and PDF format to JSEoradea@yahoo.com, according to the formatting instructions. Once the manuscript is submitted, the authors will shortly receive a feedback regarding the status of their submission. As the review process is completed, the author will be informed about the reviewers' comments and the changes the paper should suffer in order to satisfy the journal quality requirements.

Journal of Sustainable Energy JSE is covered/indexed/abstracted in:

- [Index Copernicus](#)
- [Ulrich's Update - Periodicals Directory](#)
- Engineering village (Pending)

The JSE poate fi achiziționat pe bază de abonament anual (cele 4 numere) la următoarele prețuri: tipărit – 50 €, format electronic – 20 €, sau individual (fiecare număr), la următoarele prețuri: tipărit – 20 €, format electronic – 8 €. Pentru achiziție se completează "comanda" tipizată (www.energy-cie.ro) și se transmite în format electronic sau prin fax. Pe baza comenzi se generează factura proformă (www.energy-cie.ro) care se transmite solicitantului. După achitarea sumei inscrisă în factură solicitantul primește numerele JSE comandate și factura.

Publishing House name/address:
Editura Universitatii din Oradea
Universitatea din Oradea, Universitatii Str., No. 1, 410087, Oradea, Bihor, Romania

- ISSN: 2067-5538
- Tel.: 00-40-259-408171 (231, 288)
- Fax: 00-40-259-408404
- Place of publishing: Oradea, Romania
- Year of the first issue: 1976
- Releasing frequency: 4 / year
- Language: English

CONTENTS

| | |
|--|----|
| <i>RELIABILITY AND SYSTEMS ENERGY QUALITY SERVICES</i> | |
| SUSTAINABILITY CHALLENGES FOR FUTURE ENERGY SYSTEMS | 6 |
| CHICCO G. | |
| <i>CONTRIBUTIONS TO RELIABILITY MODELLING AND EVALUATION OF AUTOMATION</i> | |
| STRUCTURE SUBSYSTEMS IN URBAN MEDIUM VOLTAGE ELECTRIC NETWORKS | 17 |
| FELEA I., ALBUT-DANA D., PĂCUREANU I. | |
| <i>STRUCTURAL ANALYSIS OF HIGH VOLTAGE ELECTRIC EQUIPMENT</i> | |
| WITH A VIEW TO THE SEISMIC CAPABILITY ASSESSMENT..... | 24 |
| MIRCEA P.M., MANEA I., MIRCEA I. | |
| <i>INTUITIONISTIC FUZZY METHODS IN SOFTWARE RELIABILITY MODELLING</i> | |
| ALBEANU G., POPENTIU-VLADICESCU FL. | 30 |
| <i>STATE OF THE ART AND PERSPECTIVES REGARDING</i> | |
| THE TECHNICAL DIAGNOSIS OF POWER TRANSFORMERS..... | 35 |
| FELEA I., BOJA I., BARLA E. | |
| <i>ADOPTING AN OPTIMAL MAINTENANCE STRATEGY</i> | |
| BY USING MULTICRITERIAL DECISIONAL MODELS..... | 42 |
| CĂRLAN M., OLTEAN M., BENDEA C., ALBUT-DANA D., BLAGA A., SAS A. | |
| <i>SIGNAL ANALYSIS IN POLLUTED POWER NETWORKS</i> | |
| GHEORGHE D., CHINDRIŞ M., VASILIU R., BINDIU R., POP G., GECAN C. | 46 |
| <i>OPPORTUNITY TO ADOPT RCM STRATEGY TO MAINTENANCE ENERGY INSTALLATIONS</i> | |
| BARLA E., POPOVICI D., DUMITRESCU D., GOIA E., GOIA H., CĂRLAN M. | 52 |
| <i>RENEWABLE SOURCES OF ENERGY. SUSTAINABLE ENERGY TECHNOLOGIES</i> | |
| COMPREHENSIVE EVALUATION AND MONITORING OF | |
| SOLAR THERMAL COMBISYSTEMS FOR DETACHED HOUSES | 55 |
| THÜR A., BREIDLER J. | |
| <i>MODELING AND SIMULATION OF AN ENERGY</i> | |
| PRODUCTION SYSTEM WITH SOLIDE OXID FUELL CELL | 60 |
| LAZAROIU G., BOGDAN M.I. | |
| <i>SCADA AND HPMS FUNCTIONS TO BE ACHIEVED BY HYDRO POWER DISPATCHER</i> | |
| SYSTEM (DHA SYSTEM), IN CASE OF CASCADED HYDROELECTRIC POWER PLANTS | 66 |
| VATRĂ F., POIDA A. | |
| <i>NEW NANOHYBRIDE CATHALYTIC SYSTEMS FOR</i> | |
| OXYGEN REDUCTION IN RENEWABLE FUEL CELLS | 72 |
| BANU A., MARCU M., TEODORESCU V. | |
| <i>PEM FUEL CELLS MODELING AND THEIR USE IN A DC DISTRIBUTION SYSTEM</i> | |
| GECAN C.-O., CHINDRIŞ M., POP G. V., BINDIU R., VASILIU R., DANIEL G. | 76 |
| <i>POLARISATION MEASUREMENTS USED FOR CORROSION RATES DETERMINATION</i> | |
| BADEA G.E., CĂRĂBAN A., SEBEŞAN M., CREȚ P., DZITAC S., SETEL A. | 83 |
| <i>EVOLUTION OF POWER ELECTRIC SYSTEMS TRANSPORT AND DISTRIBUTION.</i> | |
| <i>ENERGY SYSTEM'S PERFORMANCE</i> | |
| SOFTWARE TOOL DEVELOPED FOR DEREGULATED POWER SYSTEM ANALYSIS | 87 |
| KILYENI S., BARBULESU C., JIGORIA-OPREA D., CRISTIAN D.P. | |
| <i>KNOWLEDGE BASE FOR ELECTRICAL DISTRIBUTION NETWORKS RECONFIGURATION</i> | |
| BORLEA I., JIGORIA-OPREA D., LUSTREA B., VINTĂN M. | 97 |

| | |
|--|-----|
| ENERGY ISSUES AND THE IMPACT ON ADJACENT METALLIC STRUCTURES OF RUNNING ROUTES IN URBAN ELECTRIC TRANSPORT SYSTEMS | 103 |
| CSUZI I., LINGVAY I., SILAGHI E., LINGVAY C. | |
| REQUIREMENTS AND CONDITIONS FOR POWER DEMAND AND QUALITY PARAMETERS SYSTEM DEPLOYMENT FOR PUBLIC LIGHTING IN ROMANIA..... | 110 |
| IACOB A., ALEXANDRESCU R. M., SALCEANU C., IONESCU I., RACOVITAN I. | |
| <i>MARKET AND STOCK-MARKET OF POWER. MANAGEMENT OF POWER SYSTEMS</i> | |
| STRATEGIC MARKS IN THE BEHAVIOURAL MODELING OF ENERGY DISCHARGE | 115 |
| DUMITRESCU D., HORA C., DZITAC S., POPPER L. | |