PROCEEDINGS OF SPIE

Fifth International Conference on Green Energy, Environment, and Sustainable Development (GEESD 2024)

Mohammadreza Aghaei Xiaoshuan Zhang Hongyu Ren Editors

28–30 June 2024 Mianyang, China

Organized by Hubei Zhongke Institute of Geology and Environment Technology (China)

Published by SPIE

Volume 13279

Part One of Two Parts

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in Fifth International Conference on Green Energy, Environment, and Sustainable Development (GEESD 2024), edited by Mohammadreza Aghaei, Xiaoshuan Zhang, Hongyu Ren, Proc. of SPIE 13279, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510683006

ISBN: 9781510683013 (electronic)

Published by

SPIF

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

XΥ

Conference Committee

Part One

GREEN ENERGY AND SYSTEM

13279 02	Hybrid hydro-PV system with pumped storage for rural region [13279-12]
13279 03	Study on ecological and environmental effects of large-scale photovoltaic development in desert [13279-98]
13279 04	Optimized scheduling of wind-solar energy storage system using adaptive variable step size SMPC [13279-70]
13279 05	Hybrid Lévy flight and chaotic-based monodon monoceros-alexander archipelago wolf optimization algorithm for active power loss reduction and voltage stability enhancement in grid connected renewable energy systems [13279-2]
13279 06	Preparation of high purity copper sulfate from semiconductor waste electronic grade sulfuric acid [13279-33]
13279 07	Efficiency of overhead power lines magnetic field combined electromagnetic silence [13279-25]
13279 08	Electrifying the future: a comprehensive review of electric vehicles in transportation [13279-13]
13279 09	Analysis of quality and electricity loss in 0.4 kV networks using machine learning algorithms [13279-24]
13279 0A	Residual model-based fault diagnosis of SOFC system [13279-135]
13279 OB	Challenges and risks of using renewable energy sources [13279-20]
13279 OC	Stability analysis and support timing evaluation of underground powerhouse at the Kala hydropower station [13279-85]
13279 OD	Stability analysis of the intake diversion tunnel in Jinshuitan pumped storage power station [13279-54]
13279 OE	Analysis of failure cause of leakage of ammonia supply pipeline in urea hydrolysis reactor of an ultra-supercritical unit [13279-104]
13279 OF	An improvement of the transient voltage assessment method of the DC receiving-end considering access of high-proportion photovoltaic [13279-116]

13279 OG	Study on wind resource assessment of WRF-LES model under different driving methods [13279-71]
13279 OH	Numerical analysis of methanol steam reforming in a monolith reactor [13279-166]
13279 01	Simulation study on wind-solar coupling hydrogen production system [13279-159]
13279 OJ	Coordinated adaptive control strategy for photovoltaic energy storage grid-connected systems based on virtual synchronous generator [13279-126]
13279 OK	Substation equipment abnormal detection based on acoustic fingerprint learning [13279-125]
13279 OL	Active mitigation method of bearing voltage for motor drive system [13279-91]
13279 OM	Stability analysis of underground cavern group regarding Yongxin pumped storage power station [13279-56]
13279 ON	Thermodynamic study on condensation heat transfer and sloshing of the liquid hydrogen storage [13279-93]
13279 00	Reactivity control in typical unit operation activities of third-generation nuclear power plants [13279-60]
13279 OP	Experimental study on the effect mechanism of metal wire on hydrogen explosion [13279-114]
13279 0Q	Exploration and analysis of integrated application of solar photovoltaic power generation and rural residential buildings in northeast China [13279-143]
13279 OR	Partial discharge fault diagnosis in substations using a combined logic and GAMF-CNN network model with transfer learning [13279-38]
13279 OS	Current status and prospect of geothermal power generation in China [13279-154]
13279 OT	Study on the risk of vehicle collisions with roadside slope photovoltaic facilities on expressway [13279-207]
13279 OU	Research on hot dry rock power generation system in Xinghua area [13279-161]
13279 OV	Measurement of noise emitted by power equipment based on coherent power [13279-176]
13279 OW	Health status of battery for substation [13279-208]
13279 OX	Analysis of the key hydraulic performances of pump-turbine with splitter blades [13279-179]

13279 OY	Analysis of stress field characteristics of a certain pumped storage power station based on hydraulic fracturing test [13279-191]
13279 OZ	Application of air source heat pump assisted solar heating system in building energy saving [13279-194]
13279 10	Pressure pulsation analysis of 5+5 long and short blade pumped storage unit [13279-184]
13279 11	Dynamic balance test analysis in one hydro-power station [13279-190]
13279 12	Study on the relationship between the temperature rise limit of the heat dissipation area of NPPs and the thermal impact of marine species [13279-197]
13279 13	Analysis of advanced nuclear fuel frontier technology on the basis of the patents [13279-180]
13279 14	Research on large-scale decontamination methods and design criteria for decontamination stations in emergency scenarios of off-site nuclear accidents [13279-153]
13279 15	Study on phase resonance of long and short blades pumped storage unit [13279-146]
13279 16	Study on rapid measurement methods for clearance of nuclear ventilation filter frame [13279-212]
13279 17	A method and procedure for clearance of slightly contaminated metal materials from nuclear power plant based on the regulatory framework in China [13279-147]
13279 18	Effect of porosity of the diffusion layer on the output performance of PEMWE [13279-142]
	CHEMISTRY AND ENVIRONMENT
13279 19	Ni-Fe-Zn/AC trimetallic oxides for catalytic cracking of waste cooking oil to produce renewable fuel $[13279\text{-}19]$
13279 1A	H₂ energy production from aluminum wastes via CuO/Cu₂O-GO nanocomposite [13279-14]
13279 1B	Simulation study of phosphorus remediation using lanthanum chloride-modified fly ash and Mg-O modified biochar at the sediment water interface [13279-100]
13279 1C	Synthesis of sphere-shaped S-doped TiO_2 with enhanced performance in visible light-driven degradation of formaldehyde from PU coatings [13279-27]
13279 1D	Toxic effect of Dimethyl phthalate on <i>Daphnia magna</i> through immune related enzymes activities [13279-119]
13279 1E	Fire safety and flame-retardant property of representative wood-based composites [13279-28]

13279 1F	Optimizing on-site compaction processes for enhanced performance in cold recycling mixtures [13279-61]
13279 1G	Triphenyltin induced oxidative damage in sea urchin Glyptocidaris crenularis [13279-122]
13279 1H	Research on the impact of dry-wet cycles on water-holding and strength characteristics of silty clay [13279-89]
13279 11	Study on the performance degradation of PH13-8Mo stainless steel in hot and humid marine atmospheric environment [13279-130]
13279 1J	Improvement CO ₂ absorption of calcium-based by zirconia/alumina [13279-57]
13279 1K	Characteristics of cyclic CO ₂ adsorption after MgO doping with nitrate/carbonate [13279-67]
13279 1L	Microscopic morphology of MLG/Ti composite materials [13279-200]
13279 1M	Preparation and cleaning performance of compound cleaning agent for oily sludge [13279-73]
13279 1N	CO ₂ absorption by diethanolamine mixed with sodium humate [13279-76]
13279 10	An experimental investigation of inorganic sediment damage for CO ₂ flooding reservoirs [13279-59]
13279 1P	Biodegradation characteristics of pine lignin by Raoultella ornithinolytica MP-132 [13279-30]
13279 1Q	A typical case study of offshore CO ₂ geological sequestration in Norway [13279-137]
13279 1R	Numerical simulation of extrusion swell effect of solid propellant slurry [13279-49]
13279 1\$	Research on lubrication performance of composite micro textured journal bearing [13279-164]
13279 IT	Research on the characteristics and influencing factors of evaporative emission VOCs based on high-pressure fuel system [13279-156]
13279 1U	Investigate of mass transfer of CO_2 absorption into the mixed solution of piperazine and diethanolamine in a packed column [13279-209]
13279 IV	Research status of creep damage evaluation methods for nickel-based high-temperature alloys [13279-172]
13279 1W	Preparation and properties of functional materials of montmorillonite-biochar composite slow-release fertilizer [13279-210]

13279 1X Lattice Boltzmann method simulation of CO₂/brine two-phase transport in porous media [13279-186]

COMPUTER METHODS IN ENVIRONMENT

13279 1Y	Spectrozonal and multispectral raster lens-less microscopy of aquatic organisms: towards new contact optical methods of environmental biotesting using standard model organisms in variable environments [13279-6]
13279 1Z	Polypropylene fiber's effect on CBR in lime-stabilized sulfate-contaminated expansive clay [13279-5]
13279 20	Multispectral lens-less microscopes and optofluidic chip readers with discrete convertors of chemical and non-optical physical signals into spectrozonal optical ones as novel instruments for medical ecology, biodiagnostics, and material quality control [13279-7]
13279 21	Vibration-based fault detection and classification in ball bearings using statistical analysis and random forest [13279-16]
13279 22	Geotechnical and geophysical assessment of the 2011 Daly Brahim landslide, in the southwest of Algiers, Algeria [13279-11]
13279 23	Landslide geohazard assessment using the finite element method: a case study of PK-21 along the Djendel highway corridor, Algeria [13279-22]
13279 24	Comparative study of sustainable cement and Portland cement in terms of strength and fracture properties [13279-17]
13279 25	Elaboration and validation of IP-ANN model of fly ash-clayey soils [13279-23]
13279 26	Analysis of deformations and internal forces of diaphragm walls of a deep excavation by the open excavation method $[13279-18]$
13279 27	Metallographic DPSSL-assisted lens-less microscopy of Si-Al systems using a multiangle planar analyzer based on a polarizing microscope rotating table and a digital image correlator/2D FFT spectrometer [13279-9]
13279 28	Analysis of thermal conductivity and building energy consumption of new phase change concrete [13279-29]
13279 29	Study on properties of MNBS and characteristics of gas-liquid two-phase flow field based on MNBS [13279-72]
13279 2A	GIS-based the accessibility assessment and spatial layout optimization of parks and green spaces in Guangzhou, China [13279-46]
13279 2B	Research on the vortex-induced vibration performance and vibration suppression of long-span suspension bridge [13279-189]

13279 2C	Detection and analysis of concrete cracks in raft foundation and external wall of a basement [13279-170]
13279 2D	Design of intelligent comprehensive management and control system for mine auxiliary safety risks based on RFID technology [13279-115]
13279 2E	Field study of parallel seismic testing for evaluating the bottom depth of existing piles [13279-40]
13279 2F	Using fault tree analysis to analyze disputes in the new generation weather radar [13279-62]
13279 2G	Analysis of thermal bridge of door and window opening of low-rise fabricated steel structure with ultra-low energy consumption [13279-134]
13279 2H	Analysis on the air quality of the Yangtze River Delta region based on spatial autocorrelation and geographic detectors [13279-64]
13279 21	Comparative analysis between field test and numerical simulation of post-grouting of large diameter and ultralong bridge pile foundation [13279-66]
13279 2J	Research on the technical system of long-span green bridge construction [13279-41]
13279 2K	Experimental study on the effect of outer tube length of double-stage cyclone on separation performance [13279-204]
13279 2L	Research on the effect mechanisms of airflow disturbance on droplet distribution characteristics [13279-205]
	ECOLOGY AND RURAL ENVIRONMENT
13279 2M	Green chain [13279-1]
13279 2N	Spatial distribution characteristics of organic matter and pH in cultivated land in Wudalianchi City and their interrelationships [13279-43]
13279 20	Study of bridge green construction technology and management based on ecological protection in the Yellow River basin [13279-192]
13279 2P	Grain size and magnetic susceptibility characteristics of Bei'an loess in northern Songnen Plain and their palaeoenvironmental significance [13279-81]
Part Two	
13279 2Q	Effects of the combined application of organic and chemical fertilizers on soil microbial biomass and respiration in saline soils [13279-31]
13279 2R	Research on the sustainable development strategy of green urbanization in central and southern Hebei under the collaborative development of Beijing-Tianjin-Hebei [13279-127]

13279 2S	Correlation between land use and ecological environmental quality changes in the Yellow River Basin supported by the GEE platform [13279-32]
13279 2T	Habitat suitability assessment of <i>rhinopithecus bieti</i> based on remote sensing and GIS [13279-55]
13279 2U	Application of mud membrane coupled integrated buried treatment equipment in rural domestic sewage treatment: a case study of Taizhou, Jiangsu Province [13279-174]
13279 2V	Study on the assessment method of photovoltaic potential in agricultural greenhouses [13279-92]
13279 2W	Study on nitrogen and phosphorus contamination in sediment of foul-smelling waters in the rural areas of Wuhan $[13279\text{-}68]$
13279 2X	Evaluation of the effectiveness of carbon sink restoration in ecological conservation and restoration areas at the engineering scale [13279-80]
13279 2Y	Assessment of rural built environment based on regional adaptability: an empirical study of the Huinong Center in Guangzhou Jingxia Village [13279-87]
13279 2Z	Game analysis of pesticide overuse by farmers [13279-69]
13279 30	Analysis on the impact of agricultural modernization development on environmental pollution in Xinjiang [13279-113]
13279 31	Relation between geographical distribution of calligonum junceum community and climatic factors in Xinjiang [13279-196]
13279 32	Statistical analysis of ecological environment of wastewater pollutants in Hunan Province [13279-183]
13279 33	Study on the treatment of rural domestic sewage by mud membrane coupled integrated above-ground equipment: a case study of Putian, Fujian Province [13279-145]
	ENVIRONMENT AND POLLUTION
13279 34	Development of activated carbon for carbon dioxide capture using cocoa pod waste in the tropic [13279-4]
13279 35	Efficiency of a hybrid constructed wetland system in treating industrial wastewater: a path to sustainable phytoremediation and agricultural reuse [13279-15]
13279 36	Temporal and spatial variation of some heavy metals in limnology environment [13279-26]
13279 37	Effects of treated wastewater reuse in irrigation on germination, biomass, and antioxidant enzyme response of onion (<i>Allium cepa</i>) [13279-21]

13279 38	A novel method of waste classification for reducing the content of PCDDs in generating electricity in the process of waste incineration [13279-149]
13279 39	Research on carbon emission calculation and carbon reduction suggestions for expressway construction in Anhui province [13279-118]
13279 3A	PM _{2.5} prediction based on attention mechanism and Bi-LSTM [13279-63]
13279 3B	Study on the treatment effect of combined artificial wetland water quality purification technology on slightly polluted rivers [13279-52]
13279 3C	Effects of different ventilation modes on thermal comfort and contaminant removal effectiveness in ship cabin [13279-82]
13279 3D	Impact of various warm mixing agent on the characteristics of asphalt rubber [13279-129]
13279 3E	A novel self-attention weight transformer for air pollution smoke detection [13279-83]
13279 3F	Investigation into ozonation flotation for enhancing treatment of drilling wastewater in gas field operations [13279-152]
13279 3G	Research of pretreatment for reverse osmosis in landfill leachate treatment process [13279-35]
13279 3H	Application of heterogeneous photocatalytic technology in wastewater disinfection under the perspective of water pollution prevention and control law [13279-37]
13279 31	Preliminary analysis of four defluoridation agents [13279-123]
13279 3J	Pollution levels and ecological risks of triazine pesticide residues in surface water and sediment of Baiyang Lake, China [13279-106]
13279 3K	Comparative study on carbon emission of steel and aluminum alloy structure greenhouse building in whole life cycle [13279-168]
13279 3L	Analysis of carbon emission hotspots and trends at home and abroad based on bibliometrics $[13279\text{-}78]$
13279 3M	Research on vibration and noise reduction performance of magnetic damping material based on recycling of waste rubber [13279-99]
13279 3N	Comparative study on purification efficiency of typical fillers [13279-182]
13279 30	Spatial and temporal correlation of air pollutant and greenhouse gas emission in China [13279-148]
13279 3P	Application of new environmental protection pipe in simple automatic spraying system [13279-139]

ENERGY, ENVIRONMENT, AND ECONOMY

13279 3Q	Research on the coupling coordination of ecological conservation and economic advancement in Qinghai Province under the background of carbon peak and carbon neutrality [13279-36]
13279 3R	Analysis of development efficiency and spatio-temporal evolution of logistics industry in East China under carbon constraints [13279-42]
13279 3\$	Study on the coupling relationship between the value of grassland carbon sink and the well-being of herders in Inner Mongolia [13279-45]
13279 3T	Analyzing carbon emission reduction and economic potential of retrofitting existing residences in China's HSCW zone with progressive energy-saving targets [13279-47]
13279 3U	Exploration on energy consumption analysis and energy-saving reconstruction measures for star-rated hotels in hot summer and warm winter areas [13279-58]
13279 3V	Low-carbon path optimization for logistics distribution routing based on saving algorithm [13279-65]
13279 3W	Study on the evaluation of outdoor thermal comfort for elderly people: a case study of Chengdu, China $[13279-74]$
13279 3X	Impact of user comments on the adoption of electric vehicle charging services: evidence from contextual data from the US [13279-75]
13279 3Y	Comparative analysis of carbon emission accounting and carbon reduction effect of 3D printed concrete structures at the stage of architecturalization [13279-77]
13279 3Z	Applicability and optimization method of grey GM(1,1) model in atmospheric environment ecological safety evaluation [13279-79]
13279 40	Strategy of human-land symbiosis in Three-River-Source National Park: an evolutionary game perspective [13279-86]
13279 41	Identification mechanism and investment economic evaluation of distribution lines with low power supply reliability based on AHP and random forest algorithm [13279-107]
13279 42	A review of the progress of carbon tax-related research and the current development of carbon tax systems in East Asia [13279-112]
13279 43	Developing urban waterfront greenways for multi-objective sustainability in Chengdu [13279-117]
13279 44	Benefit evaluation of multi-energy complementary projects in Qinghai province: a case study of project F [13279-133]
13279 45	Research on rational design of asphalt pavement with semi-rigid base based on the background of dual carbon strategy [13279-138]

13279 46	Complementary ARIMA and XGBoost carbon emission timing forecasting methods for different terminal energy consumption industries [13279-151]
13279 47	Integrated green-grey-blue system: a bibliometric analysis-based review [13279-165]
13279 48	Performance evaluation and application of power grid investment in power grid enterprises based on the empirical study of 11 cities in a province [13279-203]
13279 49	Impact of environmental regulation on the technological complexity of manufacturing export: empirical analysis using panel data of 30 provinces in China [13279-171]
13279 4A	Green technological innovation, environmental administrative penalties, and urban export resilience [13279-173]
13279 4B	Analysis and evaluation on the progress of beautiful China strategy: taking Shandong Province as an example [13279-188]
13279 4C	Urban energy planning and renewable energy integration driven by energy data [13279-202]
	WATER AND MINERAL RESOURCES
13279 4D	Optimal allocation of water resources in a mining area in northern Shaanxi based on supply and demand forecasts [13279-110]
13279 4E	Numerical investigation of marine challenging gas hydrate extraction using multibranched horizontal wells [13279-51]
13279 4F	The project of reinjecting the geothermal reservoir of Wumishan Formation in Jixian System with the surface water of Dongli Lake [13279-132]
13279 4G	Comparison and numerical modelling of optional tailwater outfalls in Yuanhong investment zone [13279-163]
13279 4H	Analytical method for calculating the leakage between river and groundwater [13279-136]
13279 41	Risk analysis and evaluation of university contract water-saving renovation project based on complex network [13279-108]
13279 4J	Research progress and prospects of water quality models in water quality prediction of Danjiangkou Reservoir [13279-102]
13279 4K	Fault system and its control over deep natural gas reservoirs: taking Xujiahe fault depression in Songliao Basin as an example [13279-103]
13279 4L	Chlorophyll retrieval of typical lakes in southeast Hubei province based on landsat-8

13279 4M	Fuzhou second water source-nutrient enrichment simulation and management of Shanzai Reservoir water quality [13279-101]
13279 4N	Experimental study on sandwich type deep vacuum dewatering and consolidation of river and lake sediment [13279-50]
13279 40	Investigation on cycle variability characteristics of lean-burn in an aviation kerosene piston engine [13279-34]
13279 4P	Analysis of influencing factors of hydraulic fracturing shape in deep coalbed methane wells in Linxing block [13279-84]
13279 4Q	Study of nitrogen removal from micro-polluted surface water by the sulfur-iron autotrophic denitrification CRI [13279-124]
13279 4R	Key techniques for fine three-dimensional geological modeling of coalbed methane [13279-198]
13279 4\$	Research and analysis of directional drilling technology for long-distance pipeline crossings [13279-141]
13279 4T	Y gas field volcanic rock edge and bottom water gas reservoir supplementary pore pressure geological and development characteristics [13279-155]
13279 4U	Research and development of injection valves for HPHT, high wax content, and deep condensate gas reservoirs [13279-158]
13279 4V	Sensitivity analysis of transitional zone reservoirs in the Sazhong area of Daqing oilfield [13279-175]
13279 4W	Application of solid waste treatment and resource utilization in tertiary oil recovery in environmental engineering [13279-178]
13279 4X	Prediction of development potential in a certain well area [13279-181]
13279 4Y	Study on summer and winter seasonal variation characteristics of the absorption and scattering coefficients of a typical urban landscape lake in Hangjiahu Plain [13279-211]
13279 4Z	Investigation of chemical injection valve system structure for high-temperature and high-pressure gas reservoirs [13279-206]
13279 50	Research on the incremental changes of moisture content in natural soaking of coal particles of different scales [13279-185]
13279 51	Study on the influence of dust collector on horizontal diffusion of coal production by shearer $[13279-193]$
13279 52	Development control factors and digging technology countermeasures of fractured buried-hill reservoirs in Hailar basin [13279-195]

13279 53	Discussion on the cause and treatment of under-injection of injection wells in block X [13279-160]
13279 54	Research on improving remaining oil potential by using soluble chemical packer temporary plugging technology [13279-157]
13279 55	Study on the diurnal variation characteristics of water transparency and suspended solids in winter for an urban landscape lake in Jiaxing [13279-177]
13279 56	Adjustment method and effect evaluation of X block injection production system [13279-199]
13279 57	Study on the influence of coal particle size and evaporation time on water evaporation [13279-187]
13279 58	Study on the development characteristics of deep shale gas reservoirs in western Chongqing and their influence on reservoir quality [13279-144]