Editorial

Energy: Preface

Biswajeet Pradhan[1,2,3]

[1]Centre for Advanced Modelling and Geospatial Information Systems (CAMGIS), Faculty of Engineering and Information Technology, University of Technology Sydney, NSW 2007, Australia

[2]Department of Energy and Mineral Resources Engineering, Sejong University, Choongmu-gwan, 209 Neungdong-ro, Gwangjin-gu, Seoul 05006, Republic of Korea

[3]Center of Excellence for Climate Change Research, King Abdulaziz University, P. O. Box 80234, Jeddah 21589, Saudi Arabia

Email. biswajeet.pradhan@uts.edu.au or biswajeet24@gmail.com

Highlights:

- Contributions related to energy consumption, storage and efficiency.
- Examination of different methodologies related to efficient energy use.
- Case studies regarding energy modelling, analysis, planning and management.
- Interdisciplinary topics in the area of energy systems and applications.

Energy is a vital commodity that sustains human lives, as well as economic processes. The challenges towards energy generation, demand and supply are plenty owing to the use of fossil fuels leading to climate change and environmental problems like water and air pollution. With the increasing awareness over climate change, post Paris Agreement, the role of energy plays a key role towards achieving the proposed target. The contributions in this "Special Issue" of Geoscience Frontiers on Energy includes 8 papers from esteemed research groups worldwide which explores, highlights and provide new insights towards the various aspects of energy.

The first paper by Ramkumar et al. (2019) provided a comprehensive understanding of the energy requirements in India and highlights the obstacles from a geological point of view. The main takeaway from the article is the necessity to shift towards more usage of renewable energy resources, which could help the country achieve energy independence in a long term.

Benetatos and Giglio, (2019) demonstrated the use of a 3D modelling approach for underground hydrocarbon reservoirs, and defined a specific workflow to examine the uncertainties in a carbonated reservoir. The integrated approach developed by the authors could serve as an educational training for technicians involved in 3D modelling of hydrocarbon-bearing reservoirs.

Bandara et al. (2020) presented an experimental approach to address the issue of drop in production outputs in oil/gas projects due to proppant degradation mechanism. The authors displayed a process of selecting the right amounts of optimum proppant properties based on the oil/gas reservoir characteristics to minimize the losses.

Li et al. (2020) examined the geochemical data of South China Sea to identify the formation of methane hydrate deposits in the region. They integrated their study with past works and showed that the deep oil/gas reservoirs contribute to the formation of methane hydrate deposits in the area, thereby exhibiting biogenic methane signatures.

Silva et al. (2020) investigated the distribution of potentially hazardous elements with Efflorescent nanophases along the rich coal-mine drainages in South Brazil using advanced microscopic methods. The results of the work determined the role of hazardous elements in water pollution around the mines.

Senger et al. (2020) examined the resistivity variation in source and reservoir rocks in the Barents Shelf. The highest resistivity was found in the high-saturation hydrocarbon bearing reservoir sandstones, with a transverse resistance threshold of 1000 Ωm^2 distinguishing between the source and reservoir rocks.

Cui et al. (2020) developed a base numerical simulation model for geothermal energy exploitation by recycling CO_2 and water, to examine the various stages of CO_2 being more suitable than water during exploitation. The results show that generally CO_2 depicted better performance than water at most reservoir and operation conditions, even under a high water saturation.

Wood, (2020) used a Transparent open box algorithm to accurately predict the mineralogical brittleness index from just five basic well logs for a case study in Texas. This approach provided a viable alternative from data-driven models like multi-variate regression and machine learning.

The studies included in this special issue represent the breadth of different research activities and approaches on Energy.

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