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EDITORIAL

Sustainable energy for better social, environmental, and economic returns

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Clean energy is energy that comes from renewable, zero-emission sources that do not pollute the atmosphere when used, as well as energy saved by energy efficiency measures. Clean energy works by producing power without having negative environmental impacts, such as the release of greenhouse gases like carbon dioxide. A lot of clean energy is also renewable, including wind power, some hydroresources, and solar-powered energy generation. The most important aspect of clean energy is the environmental benefits as part of a global energy future. While clean, renewable resources also preserve the world's natural resources, they also reduce the risk of environmental disasters, such as fuel spills or the problems associated with natural gas leaks. With fuel diversification, through different power plants using different energy sources, it is possible to create reliable power supplies to enhance energy security, ensuring there is enough to meet our demands.

Clean energy provides a variety of environmental and economic benefits, including a reduction in air pollution. A diverse clean energy supply also reduces the dependence on imported fuels (and the associated financial and environmental costs this incurs). This Special Issue (SI) aimed to investigate the solution to environmental problems caused by the utilization of fossil fuels, hydrogen economy, renewable energy sources, energy conservation, energy storage and distribution, and clean energy utilization. We were thus seeking contributions from authors presenting the progress in clean energy technologies and sustainable approaches.

To address the above-mentioned requirements, this SI entitled "Sustainable energy for better social, environmental, and economic returns" received 10 manuscripts between September 1, 2022, and December 30, 2022. Most of the submissions fell into the aforementioned research topics of this SI. Finally, five manuscripts were accepted for publication in the Journal of Environmental Science and Pollution Research after providing the requested revisions by the authors where the average acceptance rate was 50%.

The published manuscripts thoroughly investigated the advancements in clean energy technologies and sustainable practices which can contribute to economic growth, public health, energy security, and technological innovation.

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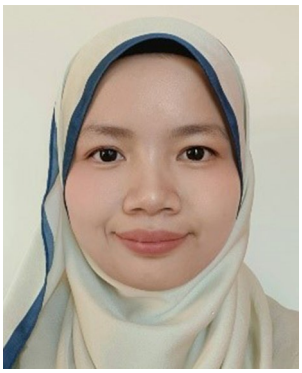
Professor Aishah Abdul Jalil received her B.Sc. (Industrial Chemistry) and M. Eng. (Chemical and Environmental Engineering) from Kitami Institute of Technology, Japan. She had an opportunity to gain experience working in a company in Japan for a year before joined the Department of Chemical Engineering, Faculty of Chemical and Natural Resources Engineering, Universiti Teknologi Malaysia (UTM), Johor, as a lecturer in 1996. Two years later, she went back to Japan for her PhD at Hokkaido University, Sapporo, sponsored by Hitachi Scholarship Foundation and graduated in Molecular Chemistry in 2002. She has appointed as a senior lecturer in 2005, associate professor in 2008, and promoted to full professor in 2015. She is very active continuing earnestly involved in teaching as well as in research with the sole intent to guide the upcoming generation towards a higher level of education. Currently, she is a Director of the Centre of Hydrogen Energy, Institute of Future Energy, UTM. Her research interests are in the area of electrochemistry, organic chemistry, development of zeolitic and advanced materials, photocatalysis, and adsorption. At present, by implementing "Chemistry for Green Applications," she has managed to publish more than 200 scientific papers in high impact international and local journals, mainly for catalytic environmental and energy applications.

Dr. Muhamed Yusuf Shahul Hameed received his bachelor's degree, majoring in chemical engineering from Universiti Malaysia Pahang, Malaysia. Through a fast-track program, he directly continued to pursue doctoral degree in chemical engineering from Universiti Teknologi Malaysia, Malaysia, under the scholarship from Malaysian government. His researched thesis focused on development work of advance silica material catalyst for combating greenhouse gasses emission and hydrogen carrier. Following that, Dr Yusuf continued to explore the potential industry for application of his research niche. He worked at oil and gas-based company as a research and development engineer. He was assigned to lead a project for carbon dioxide capture using ammonia absorption system. In December 2020, he returned and became senior lecturer at Department of Chemical Engineering, Faculty of Chemical and Energy Engineering, Universiti Teknologi Malaysia. He is also a research member at Centre of Hydrogen Energy, Institute of Future Energy University Teknologi Malaysia. Dr Yusuf leads projects on hydrogen production and carrier, and olefin productions. His research interest is geared towards acid-base catalysis and advance material for simultaneous renewable energy production and greenhouse gases elimination.



Dr. Nurfatehah Wahyuny binti Che Jusoh accomplished her academic milestones at Universiti Teknologi Malaysia (UTM), where she received her B.Eng. in Chemical Engineering in 2011 and subsequently completed her PhD in the same field in 2015. Throughout this period, her research was dedicated to the development of metal-based catalysts tailored for the efficient degradation of dyes present in wastewater. Presently, Dr. Nurfatehah holds the esteemed position of Senior Lecturer at the Malaysia-Japan International Institute of Technology (MJIIT) within UTM. Furthermore, she is an active member of the Chemical Energy Conversion and Application (CheCA) i-kohza, and she also serves as an Associate Fellow Researcher at the Centre of Hydrogen Energy, Institute of Future Energy. Dr. Nurfatehah's scholarly contributions have earned her a distinguished publication record, highlighted by an impressive h-index of 21 in the realm of heterogeneous catalysis. Her research endeavors continue to revolve around the development of heterogeneous catalytic materials, with a primary focus on their applications in photocatalysis, CO2 adsorption as innovative adsorbents, and the creation of membranes tailored for battery applications.

Dr. Nurul Sahida Hassan received her PhD in Chemical Engineering from the University Teknologi Malaysia in 2019 with a specialization in the synthesis and characterization of advanced material for heterogeneous solid acid catalysts, particularly in wastewater treatment. Previously, she has completed Master in Science (Chemistry) and degree in Bachelor of Science (Chemistry) from University Teknologi Malaysia. Before pursuing her PhD study, she worked as a chemistry lecturer at Universiti Teknologi Mara Pahang and have gained much experience in the teaching field especially in organic chemistry. At present, she is working as a post-doctorate fellowship in the School of Chemical and Energy Engineering at the University Teknologi Malaysia. She has published over 75 papers in the field of heterogeneous catalysis for energy and environmental applications. Her area of expertise includes the development of advanced heterogeneous catalysis for energy and sustainability. In particular, her work is focused on the carbon dioxide conversion.