



EDITOR-IN-CHIEF'S WORD

Dear Readers,

It is a privilege to introduce our new issue of Engineering Power, which focuses on innovative approaches to energy efficiency and sustainability. The global transition towards cleaner and more efficient energy solutions has become a key priority, driven by the need to reduce our reliance on fossil fuels and mitigate environmental impacts. Achieving this transition requires continuous advancements in renewable energy integration, energy storage, and sustainable resource management. This issue highlights emerging technologies and methodologies that support energy transition goals. The research featured here underscores the importance of efficiency, sustainability, and technological innovation in shaping the future of energy systems. I hope that these insights will inspire further exploration and development in this vital field.

Editor-in-Chief

Vedran Mornar, President of the Croatian Academy of Engineering



EDITOR'S WORD

Dear readers,

I am pleased to present to you a new issue of the journal Engineering Power, again edited by Prof. Sandro Nižetić, PhD, and Assoc. Prof. Goran Krajačić, PhD. This issue covers topics related to energy efficiency and sustainability through three papers dealing with the principles of circular economy in biowaste management, numerical simulation of asynchronous e-motor and recovery of aviation oil from organic solid waste. I hope you enjoy reading.

Editor

Bruno Zelić, Vice-President of the Croatian Academy of Engineering



FOREWORD

Nowadays, there is high demand for novel and advanced technological solutions in the field of energy to meet desired energy transition goals. The key goal is to minimize and finally to completely abandon the utilization of fossil fuels that are causing serious environmental issues worldwide. The rise in renewable energy capacities followed by efficient energy storage technologies and progress in energy efficiency are key research areas that are driving energy transition in an effective way. The key request for each novel developed technology is environmental suitability, therefore, besides the request for the performance and economic improvement of specific energy technologies, the sustainability aspect is one that should be considered to secure long-term viable solutions that would effectively contribute energy transition efforts.



This special issue brings new knowledge in the field of energy efficiency and sustainability, it consists of overall three published papers. In the work, Application of circular economy principles in biowaste management, the current market issues were discussed, as well as techno-economic trends in biowaste management. The novel approach was proposed and focused on sorting of biowaste in three different categories and that was followed by identification of their suitable treatment methods. Study contributed to the better understanding of the circular economy aspects in the case of biowaste. Work Numerical Simulation of Asynchronous E-motor with Field-Circuit Coupling was related on the comparative analysis of the two numerical methods that were applied on the asynchronous electric motor (Siemens squirrel cage induction motor). The first numerical approach was obtained using the Ansys Maxwell for finite element method, while second AVL FIRE M for finite volume method. Both applied numerical approaches demonstrated well agreement between numerical simulations and data from the manufacturer. Moreover, the finite element method showed faster convergence time. Overall, proposed work demonstrated effectiveness of the demonstrated numerical approaches and that could be used to analyze performance of the asynchronous electric motors. The mechanisms of microwave heating were analyzed in work Sustainable high-quality aviation oil recovery from organic solid wastes through microwave-assisted heating technology by comparing electrical heating in the case of high-quality aviation oil recovery from organic solid waste. Study revealed the highest energy efficiency for proposed approach of 97%, while highest total energy efficiency was 63%, in the case of microwave power of 650 W and pyrolysis temperature 460 °C. Proposed approach showed promising and effective strategy for aviation oil recovery. Previously briefly elaborated papers in this special issue provided novel approaches that are contributing to the energy efficiency and sustainability aspects.

The Guest Editors would like to thank the authors for their contribution as well as to the anonymous reviewers who have helped to improve the quality of published papers. Finally, we would like to thank Prof. Bruno Zelić, PhD for providing us with technical support for managing of this special issue.

Guest Editors

Sandro Nižetić, University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture
Goran Krajačić, University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture