



EDITOR-IN-CHIEF'S WORD

Dear Readers,

In the new issue of Engineering Power, we continue our focused exploration of energy planning and energy efficiency - a theme that has been at the core of our past two editions. The importance of these topics cannot be overstated. Energy planning is a cornerstone of the ongoing transition toward sustainable and resilient energy systems, particularly in remote and insular regions. At the same time, improving energy efficiency remains a fundamental challenge, requiring both technological advancements and strategic innovation. In this issue, our contributors explore innovative strategies for optimizing energy use and planning sustainable systems for the future. These studies not only expand on the discussions from our previous editions but also offer fresh insights and forward-thinking solutions. We thank the authors and reviewers for their contributions and trust that you will find this issue both informative and inspiring.

Editor-in-Chief

Vedran Mornar, President of the Croatian Academy of Engineering



EDITOR'S WORD

Dear Readers,

The third and last issue of the journal Engineering Power, edited by Prof. Sandro Nižetić, PhD and Assoc. Prof. Goran Krajačić, PhD, is in front of you. The theme of this issue is energy planning and energy efficiency. The three articles cover the areas of improving energy efficiency in existing buildings, digital twin models with ESG methodology as a tool in the case of the tourism sector and two-level energy planning approach for smart islands. I hope you enjoy reading this issue.

Editor

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



FOREWORD

The key aspect of energy transition is related to energy planning, which is nowadays one of the hot topics in the research community. The key obstacles related to energy planning are directed to the level of energy interconnectivity between countries, local and regional renewable energy capacities and suitable balancing strategies. The most demanding areas for energy planning are remote areas since they are usually not well connected with the mainland and become very challenging for energy planning. The final goal of energy planning is to develop smart and resilient low carbon energy systems. Besides energy planning, energy efficiency also plays a pivotal role in energy transition goals. Namely, various existing technologies, processes or systems need to be improved in terms of energy efficiency to minimize energy demands and by that to also reduce harmful impacts to the environment. Different engineering solutions need to be further refined with respect to energy efficiency and followed by novel approaches.



This special issue brings new knowledge in the field of energy planning and energy efficiency, it consists of overall three published papers. In the work Enhancing Energy Efficiency in Existing Buildings: Overview of an Innovative Forecast Control Approach for Hydronic Heating Systems, authors were focused on the forecast control systems in building heating applications. Novel proposed forecast control system represents a cost-effective solution that offers quality alternative to the traditional weather-based controllers, and that can for sure improve energy efficiency of buildings. The proposed control approach was successful in the case of the building heating system, however implementation in HVAC systems will be more challenging, mainly due to different control protocols and which is part of future research. The digital twin's strategy combined with ESG principles (Environmental, Social, and Governance) was analyzed in paper "Digital Twin Models with ESG Methodology as a Tool for Transforming Solutions in the Transport-Energy Sector with Applications to Sustainable Tourism". The focus of the work was to implement a previously mentioned approach in the case of the tourism sector. The results revealed that proposed combination of digital twins, coupled with ESG, can improve sustainability in tourism, mainly by optimizing transportation energy and use. Some practical challenges were also discussed as well as necessary adoption actions. The specific energy planning approach was discussed in the paper "Two-level energy planning approach for smart islands energy systems development". The work was generally focused on island's energy systems where local needs, as well as available resources were carefully considered, together with examined security of electric power systems. Several energy planning scenarios were analyzed within the work and modelled to reach a 100% energy self-sufficient island of Vis as case study. Key outcomes of the work clearly indicated that island's energy system can become almost self-sufficient in terms of needs for electricity and transportation. Results are encouraging more firm actions towards the development of smart and resilient low carbon island energy systems. Previously briefly elaborated papers in this special issue provided novel approaches that are contributing to the energy planning and energy efficiency topics.

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. Dr. Bruno Zelić for providing us with technical support for managing of this special issue.

Guest Editors

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