frontiers | Frontiers in Energy Research

TYPE Editorial
PUBLISHED 08 January 2024
DOI 10.3389/fenrg.2023.1354394

OPEN ACCESS

EDITED AND REVIEWED BY
Michael Carbajales-Dale,
Clemson University, United States

*CORRESPONDENCE
Michał Jasiński,
michal.jasinski@pwr.edu.pl

RECEIVED 12 December 2023
ACCEPTED 20 December 2023
PUBLISHED 08 January 2024

CITATION
Burgio A, Jasiński M and Leonowicz Z (2024), Editorial: Enabling technologies and business models for energy communities.
Front. Energy Res. 11:1354394.
doi: 10.3389/fenrg.2023.1354394

Editorial: Enabling technologies and business models for energy communities

Alessandro Burgio[1], Michał Jasiński[2,3]* and Zbigniew Leonowicz[2,3]

[1]Independent Researcher, Rende, Italy, [2]Department of Electrical Engineering Fundamentals, Faculty of Electrical Engineering, Wroclaw University of Science and Technology, Wroclaw, Poland, [3]Department of Electrical Power Engineering, Faculty of Electrical Engineering and Computer Science, VSB-Technical University of Ostrava, Ostrava, Czechia

This Research Topic on "*Enabling Technologies and Business Models for Energy Communities*" presents a comprehensive exploration of critical facets in the realm of sustainable energy transitions. The Research Topic encompasses diverse topics, ranging from smart energy frameworks for urban communities and off-grid renewable energy deployment in Mexico to the impact of institutional support on the coalbed methane industry. It further investigates complex grid investment decisions, solar-based irrigation adoption in water-scarce regions, and risk management in power supply projects. Additionally, the Research Topic delves into financial aspects, exploring the pricing of Public-Private Partnership (PPP) project Asset-backed Securities (ABS) products, the impact of managerial competence on corporate carbon performance, and equity-based predictions for the energy industry. The influence of innovation on fossil fuel abandonment in low and middle-income countries and the significance of climate risk for green innovation in heavy-polluting industries are also examined. A regional perspective is provided on the technological convergence of hydrogen energy, and the interplay between renewable energy, Gross Domestic Product (GDP), and CO_2 emissions in highly-globalized countries is scrutinized. Lastly, the effects of green credit policy on the risk of stocks prices crash are investigated. Together, these contributions offer a holistic understanding of the challenges and opportunities in enabling technologies and business models for energy communities, contributing valuable insights for researchers, policymakers, and industry stakeholders striving for a sustainable energy future.

KEYWORDS

energy communities, electricity markets, best practices, business models, consumers engagement, flexsumers, ITC

Editorial on the Research Topic
Enabling technologies and business models for energy communities

1 Introduction

In the pursuit of sustainable and resilient energy systems, the Research Topic on "*Enabling Technologies and Business Models for Energy Communities*" serves as a pivotal platform for exploring the intersection of technology and innovative business models. This Research Topic delves into the challenges and opportunities inherent in the dynamic landscape of energy transitions. From smart energy solutions to renewable energy deployment, institutional support, and corporate sustainability, each paper contributes valuable knowledge to shape the future of energy communities.

2 Research published in Research Topic

The first paper, titled "*Accelerating the Change to Smart Societies—a Strategic Knowledge-Based Framework for Smart Energy Transition of Urban Communities*," (Zaidan et al.) offers a strategic framework to expedite smart energy transitions in urban settings. It emphasizes the need for a cohesive approach to create smart societies and sustainable urban energy landscapes. Moving to Mexico, the second paper explores the "*Deployment of Sustainable Off-Grid Marine Renewable Energy Systems*" (Gorr-Pozzi et al.). This research investigates the challenges and opportunities associated with implementing off-grid marine renewable energy systems, contributing valuable insights to the discourse on decentralized energy generation. The third paper, titled "*How Does Institutional Support Affect the Coalbed Methane Industry?*" (Wei and Niu) delves into the coalbed methane sector, examining the impact of institutional support. This analysis sheds light on the critical relationship between institutions and the development of the coalbed methane industry. Addressing the complexities of grid investment decisions, the fourth paper introduces a method that considers source-grid-load-storage integration. Titled "*A Complex Grid Investment Decision Method Considering Source-Grid-Load-Storage Integration*," (Zhang et al.) this research provides a comprehensive approach to guide investment decisions in the energy system.

Shifting focus to Bangladesh, the fifth paper explores the "*Adoption Impact of Solar-Based Irrigation Facility by Water-Scarce Northwestern Areas Farmers*" (Sunny et al.). Through panel data analysis, the study evaluates the effectiveness of solar-powered irrigation in enhancing agricultural practices and water management in water-scarce regions. The sixth paper, "*Research on Construction Schedule Risk Management of Power Supply and Distribution Projects Based on MCS-AHP Model*," (Xinfa et al.) presents a risk management model for the construction schedule of power supply and distribution projects. The integration of Monte Carlo Simulation (MCS) and Analytical Hierarchy Process (AHP) provides a systematic approach to address construction schedule uncertainties. For Public-Private Partnership (PPP) projects, the seventh paper explores the "*Research on the Pricing of PPP Project ABS Products Based on the Right of Income of Heating*" (Duan and Zhang). This research investigates the pricing of Asset-Backed Securities (ABS) products based on heating income rights, contributing to the financial understanding of PPP projects in the energy sector. The eighth paper investigates "*The Impact of Managerial Competence on Corporate Carbon Performance*," (Zhao and Wang) focusing on Chinese heavy polluters. Through empirical research, the study examines how managerial competence influences corporate carbon performance, contributing valuable insights to the sustainability efforts of heavy-polluting industries.

The ninth paper proposes a method for predicting the return on equity in the energy industry based on equity characteristics. Titled "*Prediction of Return on Equity of the Energy Industry Based on Equity Characteristics*," (Yang and Wang) this research aims to enhance financial forecasting in the energy sector, providing valuable insights for investors and industry stakeholders. In the 10th paper, the research explores "*The Impact of Product and Process Innovation on Abandoning Fossil Fuel Energy Consumption in Low and Middle-Income Countries*" (Taqqadus et al.). This study investigates how innovation influences the abandonment of fossil fuel energy in less economically developed countries, contributing to the discourse on achieving carbon neutrality. The 11th paper investigates "*How Does Climate Risk Matter for Corporate Green Innovation? Empirical Evidence from Heavy-Polluting Listed Companies in China*" (Ling and Gao). Focusing on climate risk, this empirical study explores its significance for corporate green innovation strategies, particularly in industries with high environmental impact.

Taking a regional perspective, the 12th paper explores "*What Can Accelerate Technological Convergence of Hydrogen Energy*" (Lee). This research identifies factors that can accelerate the technological convergence of hydrogen energy, providing insights into fostering collaboration and innovation in the hydrogen energy sector from a regional standpoint. Examining the interplay between renewable energy adoption, GDP, and CO_2 emissions in high-globalized countries, the 13th paper "*Renewable energy, GDP and CO_2 emissions in high-globalized countries*" (Mirziyoyeva and Salahodjaev) provides valuable insights into the complex relationship between economic development, environmental sustainability, and energy choices. Finally, the 14th paper investigates the "*Effects of Green Credit Policy on the Risk of Stock Price Crash*" (Liu et al.) Focusing on the financial aspects of green policies, this research explores the effects of green credit policy on the risk of stock price crash, contributing to the understanding of sustainable finance initiatives' impact on stock markets.

3 Conclusion

In conclusion, this Research Topic synthesizes a diverse array of research papers, each offering unique perspectives and insights into the intricate challenges and opportunities in the realm of enabling technologies and business models for energy

communities. Collectively, these contributions advance our understanding of the pathways to a sustainable and resilient energy future. While diverse in focus, a general trend across the submissions underscores a growing emphasis on renewable energy adoption, innovative technological solutions, and the critical role of institutional support in shaping sustainable energy landscapes globally.

Author contributions

AB: Writing–original draft, Writing–review and editing. MJ: Writing–original draft, Writing–review and editing. ZL: Writing–original draft, Writing–review and editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note